Execution Version

BROOKFIELD MULTIPLEX CONSTRUCTION EUROPE LIMITED

and

BOUYGUES ENERGIES & SERVICES FM UK LIMITED

and

IHS LOTHIAN LIMITED

INTERFACE AGREEMENT

in connection with

THE NEW FACILITIES AT THE ROYAL HOSPITAL FOR SICK CHILDREN, CHILD AND ADOLESCENT MENTAL HEALTH SERVICE AND THE DEPARTMENT OF CLINICAL NEUROSCIENCES IN A SINGLE BUILDING ADJOINING AT THE ROYAL INFIRMARY OF EDINBURGH AT LITTLE FRANCE

Contents

BETWEEN:

(1) BROOKFIELD MULTIPLEX CONSTRUCTION EUROPE LIMITED (registered under number 03808946) whose registered office is 99 Bishopsgate, Second Floor, London EC2M 3XD ("**Contractor**");

(2) BOUYGUES ENERGIES & SERVICES FM UK LIMITED (registered under number 04243192) whose registered office is at Waterloo Centre, Elizabeth House, 39 York Road, London SE1 7NQ (the "**Service Provider**");

(3) IHS LOTHIAN LIMITED (registered under number SC493676) whose registered office is at 50 Lothian Road, Edinburgh, Scotland, EH3 9WJ ("**Project Co**").

WHEREAS:

(A) Project Co has entered into the Project Agreement with Lothian Health Board inter alia (the "**Board**") for the provision of new facilities and the provision of services.

(B) Project Co has entered into the Construction Contract with the Contractor for the design, construction, commissioning and completion of certain Facilities.

(C) Project Co has entered into the Services Contract with the Service Provider for the provision of certain Services at the Site.

(D) The Subcontractor Parties wish to enter into this interface agreement (the "**Agreement**") for the purposes of detailing certain arrangements between them in connection with matters which are the subject of the Construction Contract and the Services Contract, (individually, a "**Subcontract**" and collectively the "**Subcontracts**") in order (inter alia) (a) to regulate the recovery of any costs, losses or expenses caused to or incurred or injury suffered by any Subcontractor Party by reason of the breach by another Subcontractor Party of its Subcontract; and (b) to agree certain matters which are ancillary and incidental to the performance by the Subcontractor Parties of their respective obligations under their respective Subcontracts.

IT IS AGREED:

1. **INTERPRETATION**

1.1 This Agreement shall be interpreted in accordance with the provisions of Schedule part 1.

2. **DEFINITIONS**

In this Agreement, words and expressions shall have the meanings as are assigned to them in the Project Agreement or the Subcontracts unless otherwise stated. In addition the following expressions shall have the meanings now ascribed to them:

"**Accounting Standards**" means, in respect of any entity, the audited accounts of the entity, prepared in accordance with generally accepted accounting principles, consistently applied in the jurisdiction of the entity concerned, including any accepted international accounting standards.

"**Actual Completion Date**" has the meaning assigned to it in the Construction Contract

"**Business Day**" means a day other than a Saturday, Sunday or a bank holiday in Scotland;

"**Construction Contract**" means the construction contract dated the same date as this Agreement between Project Co and the Contractor;

"Construction Defects" means any Defects, Snagging Matters and failure to comply with the requirements of Schedule part 6 of this Agreement;

"Defects" has the same meaning assigned to it under the Construction Contract.

"Direct Losses" shall be as defined in the Project Agreement, save that: 1. for the avoidance of doubt Direct Losses incurred under this Agreement shall include all reasonable and fully substantiated costs and expenses unavoidably and necessarily incurred as a consequence of the need to utilise additional materials, additional staff and/or the use of subcontractors to remedy a Construction Defect and 2: in relation to the remediation of Construction Defects by the Service Provider on behalf of the Contractor the Service Provider shall be entitled to charge overhead and profit at a rate equivalent of 12% of the direct cost of the relevant works.

"Dispute" means any dispute, claim or difference between the Subcontractor Parties arising out of or relating to this Agreement;

"Expiry Date" means the date which is 12 years after the Actual Completion Date.

"Fast Track Interface Dispute Resolution Procedure" means the expert fast track dispute resolution procedure set out in Schedule part 3 Part **4** for the resolution of Disputes;

"**FM Design Requirements**" means the requirements of the Service Provider set out in Schedule part 5 and Schedule part 6 of this Agreement;

"**Intangible Assets**" means any goodwill, trade name, trade mark, service mark, brand name, design right, franchise, patent, other intellectual property, future income tax benefit, underwriting and formation expenses and any other item that must be accounted for under the Accounting Standards as an intangible asset.

"Interface Dispute Resolution Procedure" means the dispute resolution procedure set out in Schedule part 3 for the resolution of Disputes;

"**Net Tangible Assets**" means in respect of the Service Provider or Contractor, the total assets of that entity accounted for under the Accounting Standards and, for the avoidance of doubt, after making provision for depreciation (if any) and bad and doubtful debts), less(a) the value of the Intangible Assets of that entity; and

(b) the total liabilities of that entity,

all as would be shown in the financial statements of that entity if they were prepared at that time.

"Parties" means the parties to this Agreement (including any permitted successors or assigns of the original parties);

"Pass-Down Liability" means:

(a) any Deduction or other reduction, offset or abatement made against the Monthly Service Payment under the Project Agreement, or other liability incurred by Project Co towards the Board under the Project Agreement for which in turn one or both of the Subcontractor Parties, whether by way of indemnity, payment deduction, reimbursement or otherwise may be responsible under the Subcontracts; and / or

(b) prior to termination of the Services Contract, any reasonable expenditure which is incurred by the Service Provider in remedying any Construction Defects and

reimbursable by the Contractor, in accordance with Item 7 of Schedule part 2 to this Agreement;

"**Services Contract**" means the services contract dated the same date as this Agreement between Project Co and the Service Provider;

"Snagging Matters" has the same meaning assigned to it under the Construction Contract;

"**Sub-Contractor Change**" means any change to the Construction Contract or to the Services Contract as the case may be under the relevant Subcontract;

"Subcontractor Parties" means the Contractor and the Service Provider, each a Subcontractor Party.

3. **RIGHTS AND OBLIGATIONS**

Each of the Subcontractor Parties shall perform and undertakes to Project Co that it shall perform, the obligations set out in Schedule part 2 in the column headed with their name and shall have the benefit of those obligations of the other Subcontractor Party which are expressly provided to them.

4. **INTERACTION WITH SUBCONTRACTS**

This Agreement shall not derogate from and the rights and obligations contained in this Agreement are in addition to (and not in substitution for) the obligations and liabilities of the Subcontractor Parties to Project Co under their respective Subcontracts.

5. **CLAIMS**

5.1 Subject to Clause 6.1, if a Subcontractor Party has a claim against the other Subcontractor Party under this Agreement, it shall be entitled to recover such claim from the other Subcontractor Party and Project Co shall be automatically released from such claim

5.2 If a Subcontractor Party wishes to pursue a claim pursuant to this Agreement (other than in respect of a Pass-Down Liability which will be dealt with in accordance with clause 8), such Subcontractor Party shall as soon as reasonably practicable (and in any event within twenty (20) Business Days) of becoming aware of the incident or event giving rise to such claim serve notice on the other Subcontractor Party (with a copy to Project Co) setting out in as much detail as is practicable the relevant facts, basis of alleged liability and quantum or likely quantum of the claim.

5.3 The Subcontractor Parties (and Project Co where requested by a Subcontractor Party) shall meet within five (5) Business Days of service of notice of a claim and use reasonable endeavours in good faith to agree the claim. In the absence of agreement to the claim either Subcontractor Party may refer the claim for determination in accordance with Clause 9 (*Interface Dispute Resolution Procedure*).

5.4 If the total aggregate of all claims owed by a Subcontractor Party is less than £5,000 in any one financial year, the Subcontractor Parties shall meet at the end of financial year to effect reconciliation and payments amongst the Subcontractor Parties.

6. **PROJECT CO**

6.1 Project Co has entered into this Agreement solely to take the benefit of this Agreement and shall have no liability of whatsoever kind and howsoever arising, save in respect of:

(a) any Pass-Down Liability allocated to a Subcontractor Party under clause 8 (*Reallocation of Liabilities)* which is not met by that Subcontractor Party as a result of that Subcontractor Party becoming insolvent (as defined in Clause 40.1.1 of the Services Contract or the Construction Contract); or

(b) any liability arising under clause 8A.3 of this Agreement..

6.2 Subject to paragraph 2 of Part 1 of Schedule part 3, no party may seek to bring Project Co into the Interface Dispute Resolution Procedure.

7. **INDEMNITIES**

7.1 Subject to clauses 7.3 and 7.4 below, each Subcontractor Party (**"Indemnifying Party"**) shall indemnify and keep indemnified the other Subcontractor Party (**"Indemnified Party"**) at all times from and against all loss, damage, liability, claim, action, proceeding, cost and expense sustained by an Indemnified Party in consequence of:

(a) any injury to, or the death of, any employee of, or person engaged by the Indemnified Party arising out of any act or omission of the Indemnifying Party;

(b) any claim for, or in respect of, the death and/or personal injury of any third party arising out of any breach of this Agreement by the Indemnifying Party or negligence or any act or omission of the Indemnifying Party;

(c) any physical loss of or damage to any property or assets of the Board or any assets or other property of Project Co or any Subcontractor Party arising out of any breach of this Agreement by the Indemnifying Party or negligence or any act or omission of the Indemnifying Party;

(d) any loss of or damage to property or assets of any third party arising out of any breach of this Agreement by the Indemnifying Party or negligence or any act or omission of the Indemnifying Party;

in each such case save to the extent that any such damage, injury or death was due to any act, omission or default of the Indemnified Party, its or their employees, agents or subcontractors, save to the extent that the Indemnified Party recovers insurance proceeds in respect of the same damage, injury or death under the insurance policies maintained by Project Co on a joint names basis under the Project Agreement or otherwise maintained by an Indemnified Party (or, being entitled to, fails to pursue such recovery or to achieve such recovery for any reason whatsoever including as a result of an Indemnified Party's officer, servant, agent or subcontractor causing such insurance policy to become void, voidable, unenforceable, suspended or impaired).

7.2 If the Indemnified Party receives any notice, demand, letter or other document concerning any claim from which it appears that it is or may reasonably be expected to become entitled to indemnification pursuant to Clause 7.1, it shall give notice in writing of such claim as soon as reasonably practicable to the Indemnifying Party. Thereafter:

(a) the Indemnifying Party shall, provided that it admits the Indemnified Party's entitlement as aforesaid, be entitled to resist the claim in the name of the Indemnified Party at the Indemnifying Party's own expense and to have the conduct of any defence, dispute, compromise or appeal of the claim and of any incidental negotiations; but

(b) if the Indemnifying Party fails within twenty (20) Business Days of receipt of a notice given under this Clause 7.2 to confirm in writing its intention to apply Clause 7.2(a) or its acceptance of the Indemnified Party's entitlement, the Indemnified Party shall

be free to pay or settle the claim (provided that it consults with the Indemnifying Party and takes into account their reasonable representations in relation to such settlement) and be indemnified in respect of such under the terms of Clause 7.1.

7.3 The provisions of Clause 7.1 shall not apply to the extent the Indemnified Party is indemnified by Project Co pursuant to its Subcontract in respect of the same loss set out in Clause 7.1.

7.4 Where a Subcontractor Party is responsible for any risk, loss or damage under this Agreement they shall also be responsible to the other Subcontractor Party for any insurance excesses, deductibles and any other uninsured amounts and amounts in respect of which recovery from insurers is not made where a claim is made under an insurance policy in respect of such risk, loss or damage.

8. **REALLOCATION OF LIABILITIES**

8.1 Project Co may make an initial assessment in good faith concerning the allocation between the Subcontractor Parties of any Pass-Down Liability identified in paragraph (a) of the definition of Pass-Down Liability, and where a Subcontractor Party does not accept such allocation, that Subcontractor Party may, subject to and in accordance with this Clause 8, seek reallocation of that Pass-Down Liability in whole or in part to the other Subcontractor Party.

8.2 Any reallocation of Pass-Down Liabilities in whole or in part sought by a Subcontractor Party pursuant to this Clause 8 shall, unless agreed between the Subcontractor Parties within twenty (20) Business Days, be deemed to be disputed and then shall be determined in accordance with Clause 9. For the avoidance of doubt, Project Co shall not be joined as a party to any such procedure (but shall be kept informed of the progress of the reallocation of the Pass-Down Liability).

8.3 The grounds upon which a Pass-Down Liability shall be reallocated from one Subcontractor Party ("**Subcontractor A**") to another ("**Subcontractor B**") (wholly or in part) are that:

(a) the Pass-Down Liability arose (wholly or in part) by reason of Subcontractor B's Interface Failure, and not (or not wholly) by reason of Subcontractor A's Interface Failure or a risk borne by Subcontractor A under its Subcontract; and/or

(b) the Pass-Down Liability arose from Subcontractor A's Interface Failure but this was in turn (wholly or in part) caused or contributed to by or arose from Subcontractor B's Interface Failure.

8.4 The Subcontractor Parties agree that responsibility for a Pass-Down Liability may be shared, and that in such cases the Pass-Down Liability shall be reallocated between them in such proportions as are just and equitable, having regard to the grounds for reallocation set out in Clause 8.3.

8.5 Where a Pass-Down Liability is reallocated from one Subcontractor Party ("**Subcontractor A**") to another ("**Subcontractor B**") pursuant to this Clause 8 then subject to clause 8A, the amount of that Pass-Down Liability (or the amount thereof which is being reallocated) shall be paid by Subcontractor B to Subcontractor A together with interest at the Default Interest Rate calculated from the date on which the Pass-Down Liability was suffered financially by Subcontractor A until the date of payment by Subcontractor B. The date for payment shall be as agreed between the parties or as determined pursuant to Clause 9 if no agreement is reached.

8.6 All reallocations of Pass-Down Liabilities from one Subcontractor Party to another pursuant to this Clause 8 shall be promptly notified to Project Co in writing by the Subcontractor Party to whom the Pass-Down Liability is reallocated.

8.7 Not used.

8.8 A Subcontractor Party shall not reallocate a liability pursuant to this Clause 8 for which it is liable to indemnify that other Subcontractor Party pursuant to Clause 7.

8.9 For the purposes of this Clause 8, '**Interface Failure**' means:

(a) under-performance of a Subcontractor Party under its Subcontract where the appropriate response and/or rectification times under its Subcontract have elapsed; or

(b) under-performance of a Subcontractor Party under its Subcontract where the appropriate response and/or rectification times under its Subcontract have not elapsed, but the under-performance was caused by a failure of that Subcontractor Party to comply with its method statement(s); or

(c) under-performance of a Subcontractor Party (the "**Underperforming Subcontractor**") under its Subcontract where the appropriate response and/or rectification times under its Subcontract have not elapsed but the Underperforming Subcontractor has not since becoming aware of the under-performance, used reasonable endeavours and appropriate steps to mitigate against the potential consequences and liabilities that the other Subcontractor Party may suffer, including but not limited to, taking all reasonable steps to remedy the under-performance as soon as reasonably practicable (provided that the other Subcontractor Party acts reasonably, in identifying and notifying the Underperforming Subcontractor of such potential consequences and liabilities that it may incur); or

(d) any other breach by a Subcontractor Party of its Subcontract or the occurrence of a risk borne by that Subcontractor Party under its Subcontract arising out of the performance or under-performance of that Subcontractor under its Subcontract where no response or rectification time is applicable.

8A LIABILITY CAPS

8A.1 Where a Pass-Down Liability is reallocated pursuant to clause 8, the amount of such liability (or such part of the same as is reallocated and paid as aforesaid) shall no longer be treated as a liability suffered by the Subcontractor Party away from whom the reallocation was made for the purposes of any cap on liability under its Subcontract and this Agreement, and such cap shall accordingly stand refreshed to the figure immediately prior to the original allocation having been made.

8A.2 The amount of any Pass-Down Liability that is reallocated to a Subcontractor Party pursuant to clause 8 shall be treated as a liability suffered by the Subcontractor Party to whom the reallocation is made, for the purposes of any cap on liability under its Subcontract (as appropriate) and such reallocation shall be applied against the relevant caps on liability set out in its Subcontract.

8A.3 To the extent that any re-allocated Pass-Down Liability when aggregated with all other relevant liabilities (which are subject to any cap on liability under the said Subcontract) exceeds the cap on liability which is applied pursuant to Clause 8A.2 the Subcontractor Party to whom reallocation was made shall have no obligation to make any payment of any

amount which is in excess of such cap on liability (the "**Outstanding Amount**") to the other Subcontractor Party in respect of the amount due under Clause 8.5. Project Co shall be liable to the other Subcontractor Party for the Outstanding Amount.

8A.4 Notwithstanding any other position of this Agreement or the Subcontract, no liability incurred by a Subcontractor under this Agreement (other than a Pass-Down Liability reallocated under clause 8 of this Agreement), shall count towards that Subcontractor's liability cap under its Subcontract.

9. **INTERFACE DISPUTE RESOLUTION PROCEDURE**

9.1 Without prejudice to the Subcontractor Parties' obligations under their respective Subcontracts but subject to Clause 6.2 hereof, the Interface Dispute Resolution Procedure shall apply to any Dispute which arises out of or relating to this Agreement.

10. **NOVATION**

10.1 In the event of a replacement Subcontractor Party being appointed by Project Co, the Subcontractor Parties shall on request of Project Co enter into a deed of novation in relation to this Agreement with the replacement subcontractor in the form set out at Schedule part 4 with such amendments to the deed of novation as may reasonably be required to fully effect such novation.

10.2 The Subcontractor Party being replaced ("**Exit Co**") shall bear the reasonable costs and expenses incurred by Project Co and the other Subcontractor Party, in connection with negotiating, preparing and executing a deed of novation in accordance with Clause 10.1, save where Exit Co is insolvent (as defined in Clause 40.1.1 of the Services Contract or the Construction Contract) in which case Project Co shall bear the costs and expenses of the other Subcontractor Party.

11. **MISCELLANEOUS**

11.1 **SEVERABILITY**

If any provision of this Agreement is held to be illegal or unenforceable, the validity or enforceability of the remaining provisions shall not be affected.

11.2 **GOVERNING LAW**

(a) This Agreement is governed by Scottish law.

(b) Subject to the provision of the Interface Dispute Resolution Procedure, the parties agree that the courts of Scotland shall have exclusive jurisdiction to hear and settle any action, suit, proceeding or dispute in connection with this Agreement and irrevocably submit to the jurisdiction of those courts.

11.3 **AMENDMENTS**

(a) This Agreement shall not be amended except in writing signed by duly authorised signatories of all the parties.

(b) The parties agree that no amendment to a Subcontract that would have a material adverse effect on a Subcontractor Party (other than the Subcontractor Party who is a party to that Subcontract) will take effect for the purposes of this Agreement without the written approval of the Subcontractor Party or Subcontractor Parties who will suffer such material adverse effect.

11.4 **ENTIRE AGREEMENT**

This Agreement supersedes any prior agreement or understandings among the parties concerning its subject matter and together with the relevant Subcontract, and guaranteesand any agreement referred to in this Agreement or in such Subcontract or guarantees constitutes the entire agreement between them.

11.5 **NO AGENCY**

Save as otherwise provided in this Agreement, neither of the Subcontractor Parties shall be or be deemed to be an agent of Project Co and each of the Subcontractor Parties shall not hold itself out as having authority or power to bind Project Co in any way.

11.6 **RIGHTS OF THIRD PARTIES**

Save to the extent expressly provided in this Agreement and, to avoid doubt, without prejudice to the terms of the Funders' Direct Agreement, the Funder's Service Provider Direct Agreement, the Funder's Contractor Direct Agreement or the rights of any permitted successor to the rights of Project Co or of any permitted assignee, it is expressly declared that no rights shall be conferred under and arising out of this Agreement upon any person other than the parties to this Agreement and without prejudice to the generality of the foregoing, there shall not be created by this Agreement a jus quaesitum tertio in favour of any person whatsoever.

11.7 **FRAUD AND FRAUDULENT MISREPRESENTATION**

Nothing in this Agreement is intended to, or shall operate so as to, exclude or limit any liability for fraud or fraudulent misrepresentation.

11.8 **NOTICES**

(a) All notices under this Agreement shall be in writing and all invoices or notices to be given under the terms of this Agreement shall be served by sending the same by first class post or by hand, leaving the same at:

If to the Service Provider	Bouygues E&S FM UK Limited Waterloo Centre, Elizabeth House, 39 York Road, London SE1 7NQ FAO: Xavier Plumley, Company Secretary
If to Project Co	50 Lothian Road, Edinburgh, EH3 9WJ FAO: Wallace Weir
If to the Contractor	Brookfield Multiplex Construction Europe Limited Level 2, 99 Bishopsgate, London EC2M 3XD FAO: Ben Keenan, Company Secretary

(b) Any party to this Agreement may change its nominated address by prior written notice to all the other parties.

(c) Notices given by post shall be effective upon the earlier of (i) actual receipt, and (ii) five (5) Business Days after mailing. Notices delivered by hand shall be effective upon delivery.

11.9 **ASSIGNATION**

(a) The Subcontractor Parties shall not, without the prior written consent of Project Co and the other Subcontractor Party (such consent not to be unreasonably withheld), assign, transfer or otherwise dispose of any interest in this Agreement and neither Subcontractor Party shall grant or purport to grant any security interest over or in relation to this Agreement except with the prior written consent of Project Co in its absolute discretion.

(b) Project Co shall be freely entitled without the consent of the Subcontractor Parties to transfer or assign (including by way of security or charge) the benefit of this Agreement or any benefit arising from this Agreement and any such transfer or assignation may include the right to make second and subsequent assignments (including in order to perfect or enforce such assignment or charge).

12. **TERMINATION**

12.1 If a Subcontractor Party's appointment under its Subcontract is terminated, then save for and subject to the obligations on that Subcontractor Party under Clause 10 and without prejudice to the accrued rights and liabilities of the Subcontractor Party hereunder as at the date of termination of the relevant Subcontract, the Subcontractor Party shall have no further obligations under this Agreement.

12.2 Without prejudice to Project Co's right to receipt of compensation on termination, from each Subcontractor Party under each Subcontract, in the event that Subcontractor A's appointment under its Subcontract is terminated for breach of its Subcontract as a result of an act or omission of Subcontractor B then, subject to clause 13, Subcontractor B shall be liable to Subcontractor A in respect of:

(a) any costs or losses of Subcontractor A incurred to Project Co in accordance with its Subcontract; and

(b) any amounts that would have been payable to Subcontractor A in accordance with its Subcontract in circumstances where the Subcontract had been terminated for Project Co default.

12.3 This Agreement shall terminate upon the date of termination of the Project Agreement (without prejudice to the accrued rights and liabilities of the parties arising hereunder up to and including the date of termination). The Contractor's liabilities under this Agreement shall expire on the date falling 12 years after the Actual Completion Date, save in respect of claims notified to the Contractor by Project Co and/or the Service Provider prior to such expiry date and subject to any accrued rights and obligations.

13. **LIMITATIONS ON LIABILITY**

13.1 The aggregate liability of the Subcontractor Parties to each other for any matters under this Agreement shall not, save as set out in clause 13.2 or 13.3, exceed the financial limits set out below:

(a) the Contractor limited to £7,000,000 (seven million pounds) for any liability to or loss suffered or incurred by the Service Provider

(b) the Service Provider limited to £2,600,000 (two million six hundred thousand pounds) for any liability to or loss suffered or incurred by the Contractor;

13.2 The Subcontractor Parties do not exclude or restrict liability, for any of the following and no liability for the same shall be taken into account in determining whether any limit of liability under clause 13.1 has been reached or exceeded:

(a) payments made by a Subcontractor Party to the extent corresponding payments are received by such Subcontractor Party pursuant to insurance policies;

(b) a Subcontractor Party's liability in the event of any fraud, fraudulent misrepresentation, corruption or wilful default (which for the purposes of this clause shall exclude abandonment) of such Subcontractor Party;

(c) a Subcontractor Party's liability in respect of its indemnity obligations set out in clause 7; and

(d) the costs of enforcement or defence or the amount of any costs awarded against a Subcontractor Party in respect of any obligation under this Agreement which requires the other Subcontractor Party to enforce or defend its rights under this Agreement.

13.3 Nothing in this Clause 13 shall:

(a) limit the reallocation and/or recovery in relation to Pass-Down Liabilities pursuant to Clause 8; or

(b) subject to clause 6.1 (*Project Co*), result in any claim against Project Co for any Pass-Down Liability which the relevant Subcontractor Party is unable to recover under the reallocation mechanism in Clause 8 (*Reallocation of Liabilities*).

14. NET ASSET TEST

(a) The Contractor undertakes to the Service Provider that at no time prior to the Expiry Date will the value of the Contractor's Net Tangible Assets be less than £20,000,000.

(b) If at any time prior to the Expiry Date the Contractor is in breach of clause 14 (a), then the Contractor must, within 14 days, deliver to the Service Provider either:

(i) a parent company guarantee (in form attached as Schedule Part 7) from Brookfield Multiplex Pty Ltd (ACN 147 631 472) whose registered office is at Level 22, 135 King Street, Sydney, Australia ~~in respect of the obligations of the Service Provider under this Agreement~~ in respect of the obligations of the Contractor under this Agreement; or BIC

(ii) an irrevocable letter of credit or an on-demand performance bond issued by an entity that is at least investment grade for the amount of £7,000,000.

(c) The Service Provider shall within 90 days of the date of this Agreement deliver to the Contractor a parent company guarantee (in form attached at Schedule Part 7) from Bouygues Energies & Services S.A.S (company number RCS Versailles 775

664 873) whose registered office is at 19 Rue Stephenson, 78180 Montigny-le-Bretonneux, France in respect of the obligations of the Service Provider under this Agreement.

(d) Any security provided by the Contractor pursuant to clause 14(b) shall remain in place until the earlier of the Expiry Date or the date on which the Contractor's Net Tangible Assets are restored to the applicable threshold set out in clause 14(a) save in respect of where there has been a claims made prior to the said expiry in which case the security provided by the Contractor shall remain in place until determination of the claim unless the Contractor maintains Net Tangible Assets of £20,000,000 or more.

(e) The parent company guarantee provided by the Service Provider pursuant to clause 14(c) shall remain in place until the earlier of the Expiry Date or the date on which the Service Provider's Net Tangible Assets are £5,000,000 or more save that in respect of any claim made prior to the said expiry the Service Provider parent company guarantee shall remain in place until determination of the claim unless the Service Provider maintains Net Tangible Assets of £5,000,000 or more. The Service Provider shall, within 14 days, deliver to the Contractor a further parent company guarantee (in form attached as Schedule Part 7) if at any time prior to the Expiry Date the Service Provider's Net Tangible Assets fall below £5,000,000.

(f) The Contractor's obligation to comply with clause 14(a) shall cease to apply if and for so long as the Service Provider is in breach of its obligations to either provide a parent company guarantee pursuant to clauses 14(c) or 14(e) or, alternatively, to evidence that the Service Provider's Net Tangible Assets are £5,000,000 or more.

(g) Either party may request, at intervals of no less than 3 months, from the other written confirmation from their CFO that the Net Tangible Asset thresholds referred to in clauses 14(a) and 14(e), as the case may be, have been maintained at the time of request.

15. MITIGATION

Where a Subcontractor Party becomes entitled to claim any losses, costs or expenses or any part thereof from the other Subcontractor Party under this Agreement, the Subcontractor Party making such claim shall be obliged to use all reasonable endeavours to mitigate such loss and/or the entitlement to recover such from the other Subcontractor Party including recovering such loss or entitlement under an insurance policy.

16. PRECEDENCE

The following order of precedence shall apply in respect of this Agreement and in the event of any conflict or inconsistency between or among the terms of any of the documents that comprise this Agreement, the terms of the document with a higher precedence, as stated below, shall govern and control:-

(a) Firstly, the Project Agreement;

(b) Secondly the Subcontracts; and

(c) Thirdly, this Agreement.

IN WITNESS WHEREOF these presents typewritten on this and the preceding 13 pages together with the Schedule in 7 Parts are executed by the parties hereto as follows:.

SUBSCRIBED for and on behalf of **BROOKFIELD MULTIPLEX CONSTRUCTION EUROPE LIMITED**

at London

[redacted] ws: -

d Signatory)

Before this witness: -

[redacted]

SUBSCRIBED for and on behalf of **BOUYGUES E&S FM UK LIMITED**

at London

[redacted]

SIGNED for and on behalf of the
said IHS LOTHIAN LIMITED acting
under a power of attorney

at LONDON

on 13TH FEBRUARY 2015

by

[redacted] .....

Print Full Name

[redacted]

and

[redacted] .....

Print Full Name

[redacted]

This is the Schedule in 7 parts referred to in the foregoing contract between IHS LOTHIAN LIMITED and BOUYGUES E&S FM UK LIMITED and BROOKFIELD MULTIPLEX CONSTRUCTION EUROPE LIMITED

SCHEDULE TO THE INTERFACE AGREEMENT

SCHEDULE PART 1

INTERPRETATION

This Agreement shall be interpreted according to the following provisions, unless the context requires a different meaning:

1. The headings and marginal notes and references to them in this Agreement shall be deemed not to be part of this Agreement and shall not be taken into consideration in the interpretation of this Agreement.

2. Except where the context expressly requires otherwise, references to Clauses, Sub-clauses, paragraphs, sub-paragraphs, and parts of the Schedules are references to Clauses, Sub-clauses, paragraphs, sub-paragraphs and parts of the Schedules to this Agreement and references to Sections, Appendices and Attachments (if any) are references to Sections, Appendices and Attachments to or contained in this Agreement.

3. The Schedules and Attachments (if any) to this Agreement are integral parts of this Agreement and a reference to this Agreement includes a reference to the Schedule and the Attachments (if any).

4. Words importing persons shall, where the context so requires or admits, include individuals, firms, partnerships, trusts, the Board, corporations, governments, governmental bodies, authorities, agencies, unincorporated bodies of persons or associations and any organisations having legal capacity.

5. Where the context so requires words importing the singular only also include the plural and vice versa and words importing the masculine shall be construed as including the feminine or the neuter or vice versa.

6. The language of this Agreement is English. All correspondence, notices, drawings, Design Data, test reports, certificates, specifications and information shall be in English. All operating and maintenance instructions, name plates, identification labels, instructions and notices to the public and staff and all other written, printed or electronically readable matter required in accordance with, or for purposes envisaged by, this Agreement shall be in English.

7. Save where stated to the contrary, references to any agreement or document include (subject to all relevant approvals and any other provisions of this Agreement concerning amendments to agreements or documents) a reference to that agreement or document as amended, supplemented, substituted, novated or assigned.

8. References to any Law are to be construed as references to that Law as from time to time amended or to any Law from time to time replacing, extending, consolidating or amending the same.

9. References to a public organisation (other than the Board) shall be deemed to include a reference to any successor to such public organisation or any organisation or entity which has taken over either or both the functions and responsibilities of such public organisation. References to other persons shall include their successors and assignees.

10. References to other persons (other than the Subcontractor Parties and Project Co) shall include their successors and assignees.

11. The words in this Agreement shall bear their natural meaning. The parties have had the opportunity to take legal advice on this Agreement and no term shall, therefore, be

construed contra proferentem.

12. Reference to "parties" means the parties to this Agreement and references to "a party" mean one of the parties to this Agreement.

13. In construing this Agreement, the rule known as the ejusdem generis rule shall not apply nor shall any similar rule or approach to the construction of this Agreement and accordingly general words introduced or followed by the word "other" or "including" or "in particular" shall not be given a restrictive meaning because they are followed or preceded (as the case may be) by particular examples intended to fall within the meaning of the general words.

14. Where this Agreement states that an obligation shall be performed "no later than" or "within" or "by" a prescribed number of Business Days after a stipulated date or event, or "no later than" or "by" a stipulated date or event which is a prescribed number of Business Days after a stipulated date or event the latest time for performance shall be noon on the last Business Day for performance of the obligations concerned.

15. The words in this Agreement shall bear their natural meaning. The parties have had the opportunity to take legal advice on this Agreement and no term shall, therefore, be construed contra proferentem.

16. Reference to a document being in the Agreed Form is a reference to the form of the relevant document agreed between the parties and for the purpose of identification initialled by each of them or on their behalf.

17. Words in parenthesis and italics appearing after a Clause reference or a reference to a Schedule are inserted for ease of reference only. If there is any discrepancy between the Clause reference and the words appearing in parenthesis and italics after the Clause reference, the Clause reference shall prevail.

SCHEDULE PART 2

Subcontractor Parties' Rights and Obligations

No.	Issue	Contractor's rights and obligations	The Service Provider's rights and obligations
1.	**Obligations**	The Contractor undertakes to the Service Provider that it shall comply with its obligations under its Subcontract. Pursuant to the terms of the Construction Contract the Contractor's obligations and liabilities arising under or pursuant to its Subcontract shall expire twelve (12) years following the Actual Completion Date (as defined in the Construction Contract), save in respect of claims notified to the Contractor prior to the expiry of such period.	The Service Provider undertakes to the Contractor that it shall comply with its obligations under its Subcontract.
2.	**Claims**	The Service Provider shall be entitled to Direct Losses incurred (and to the extent arising from) any breach of this Agreement including the obligations set out herein by the Contractor.	The Contractor shall be entitled to Direct Losses incurred (and to the extent arising from) any breach of this Agreement including the obligations set out herein by the Service Provider.
3.	**Cooperation**	The Contractor agrees to, at its own expense, cooperate with the Service Provider (having regard to its obligations under its Subcontract and this Agreement) in the fulfilment of the purposes and intent of this Agreement and the relevant Subcontracts and for those purposes only it shall promptly supply to the Service Provider upon reasonable request such information as is not confidential, commercially sensitive (in the sense that its disclosure would damage a material interest of the Contractor) or is otherwise subject to impediment of law and as may be reasonably required by the Service Provider on reasonable notice.	The Service Provider agrees to, at its own expense, cooperate with the Contractor (having regard to its obligations under its Subcontract and this Agreement) in the fulfilment of the purposes and intent of this Agreement and the relevant Subcontracts and for those purposes only it shall promptly supply to the Contractor upon reasonable request such information as is not confidential, commercially sensitive (in the sense that its disclosure would damage a material interest of the Service Provider) or is otherwise subject to impediment of law and as may be reasonably required by the Contractor on reasonable notice.

No.	Issue	Contractor's rights and obligations	The Service Provider's rights and obligations
4.	**Access prior to Actual Completion**	The Contractor shall subject to the terms of the Construction Contract allow the Service Provider the right of access to the relevant Site(s) for the purposes of carrying out its obligations in accordance with the Services Contract. The Contractor shall provide to the Service Provider, at its own expense, a copy of the site rules as soon as reasonably practicable and in advance of the Service Provider 's required access. In performing the Works the Contractor shall not unreasonably hinder the Service Provider in the carrying out of its subcontract obligations	The Service Provider shall comply with all relevant safety procedures, which shall include any relevant health and safety plans for the construction of the work, the Contractor's site rules and any reasonable directions with regard to site safety issued by the Contractor from time to time. In fulfilling its subcontract obligations the Service Provider shall not unreasonably hinder the Contractor in the carrying out of the Works.
5.	**Programme and Final Commissioning Programme**	The Contractor shall make available to the Service Provider the Programme and shall consult with the Service Provider on the Final Commissioning Programme. The Contractor shall invite the Service Provider (with reasonable notice not being less than three (3) months) to witness as appropriate testing and final commissioning of facilities. The Service Provider acknowledges that the details and sequence of commissioning activities may be subject to change.	
5a	Post Completion Commissioning	The Contractor shall support the Board in the Board achieving a "clinically clean" standard by responding promptly to rectify any Construction Defects including in respect of the Handover Clean.	The Service Provider shall support the Board in the Board achieving a "clinically clean" standard by responding promptly to any request from the Board to provide Services including for the avoidance of doubt Maintenance Works in respect of the Plant or Group 1 Equipment as required.
6.	**Training**	The Contractor shall provide training on the use of equipment installed training programme to be agreed as part of Final Commissioning Programme.	
7.	**Defects**	Remedy of Construction Defects by Contractor : 1. Subject to paragraph 2 and paragraph 3 of this item 7 (Defects) of this Schedule part 2 in respect of the Service Provider's obligations, remedy all Construction Defects .	Remedy of Construction Defects by the Service Provider: 1. Promptly inform the Helpdesk and the Contractor of any Construction Defect (and in any event within two days of becoming aware of it).

No.	Issue	Contractor's rights and obligations	The Service Provider's rights and obligations
		2. Reimburse the Service Provider the reasonable cost of remedying any Construction Defect if: (i) the Contractor instructs, and the Service Provider agrees to undertake such remedial work and the Service Provider carried out such remedial work to Construction Defects on the Contractor's behalf or (ii) the Service Provider has carried out such remedial work to Construction Defects on the Contractor's behalf pursuant to paragraphs 2 or 3 of this item 7 (Defects) of this Schedule part 2 in respect of the Service Provider's obligations. 3. Following receipt of the monthly report, the Contractor shall reimburse the Service Provider's reasonable and fully substantiated expenditure in remedying any Construction Defect in accordance with this Schedule part 2. 4. Where the Contractor is obliged to remedy any Construction Defect and any damage caused thereby, the Contractor shall comply with the terms of Board's Construction Requirements and in such a manner as to minimise interference with the use and maintenance of the Facilities and within a reasonable time having regard to the nature of the Construction Defects and damage. **General**: Carry out de-snagging and remedial works in consultation with the Service Provider so as to minimise disruption and interference with the performance of the Service Provider's obligations under its Subcontract.	2. To the extent that the Construction Defect is considered by the Service Provider, acting reasonably, to be the cause of a Unavailability Failure or Major Performance Failure (as defined in Schedule Part 12 of the Project Agreement and Schedule Part 14 of the Project Agreement) and (i) if the Contractor is not proceeding diligently to rectify such Construction Defect; or (ii) the Service Provider considers (acting reasonably) that the existence or any immediate failure to rectify such Construction Defect is reasonably likely to give rise to the right of Project Co to terminate the Services Contract, and provided that the Service Provider has given the Contractor such opportunity to rectify the Construction Defect as the circumstances reasonably allow, then the Service Provider may elect to remedy such Construction Defect as required to ensure compliance as soon as reasonably practicable within the terms of the Service Requirements (as defined in Schedule Part 12 of the Project Agreement and Schedule Part 14 of the Project Agreement). 3. To the extent the Service Provider is able, carry out such temporary repair in respect of the Construction Defects referred to in paragraph 2 above as the Service Provider considers is required to mitigate the risk of Pass-Down Liability and/or risk of termination of the Services Contract, provided that the cost of such temporary repairs shall be not be disproportionate to the costs of likely Pass-Down Liability and/or the costs of final remedy/repair 4. Provide monthly reports of work done under

No.	Issue	Contractor's rights and obligations	The Service Provider's rights and obligations
			paragraphs 2 and paragraph 3. Following receipt of the monthly report, the Contractor shall reimburse the Service Provider's Direct Losses in remedying any Construction Defect in accordance with this Schedule part 2. 5. Where the Service Provider remedies any Construction Defect and any damage caused thereby, the Service Provider shall comply with the terms of Board's Construction Requirements and in such a manner as to minimise interference with the use and maintenance of the Facilities; and within a reasonable time having regard to the nature of the Construction Defects and damage. General: 1. Make safe the Construction Defect and take reasonable steps to mitigate its effect upon availability of Facilities and performance of Service Provider's services. 2. Co-operate to facilitate efficient and effective remedying by the Contractor of a Construction Defect.
8.	**Manuals and information**	1. The Contractor shall provide the Service Provider with the information on maintenance regimes and life expectancy not later than six (6) months before the Actual Completion Date, and in accordance with the templates provided by the Service Provider, pursuant to paragraph 1 of this item 8 (Manuals and information) of this Schedule part 2 in respect of the Service Provider's obligation.	1. The Service Provider shall provide the specific templates for life cycle analysis information, including maintenance and life expectancy provision within 1 month of the date of this Agreement.

No.	Issue	Contractor's rights and obligations	The Service Provider's rights and obligations
		2. The Contractor shall provide the Service Provider with access to electronic database for O&M manuals not later than six (6) months before the Actual Completion Date. 3. The Contractor shall provide the Service Provider with vendor information such as plant information, operating and maintenance manuals, equipment schedules, the health & safety file (excluding final handover documentation), room data sheets, manufacturers warranties and guarantees, draft final drawings and draft final specifications (the "Documents") not later than three (3) months before the Actual Completion Date. The Service Provider shall meet on a regular basis with the Contractor to agree the format and the content of the Documents. The Contractor shall provide the Service Provider with updates of the draft Documents as appropriate. 4. Final drafts of the Documents including commissioning results shall be issued on or before the Actual Completion Date in hard copy and electronic format. 5. The Contractor grants to the Service Provider, free of charge, an irrevocable, non exclusive licence (carrying the right to grant sub-licences) to use the Documents (including relevant third party intellectual property rights) for the purposes of this Agreement and the Services Contract.	
9.	**Subcontractor Design Review Process Reviewable Design Data**	Without prejudice to the other rights and obligations of the Contractor and The Service Provider in this item 9 (Subcontractor Design Review Process Reviewable Design Data), during the development and finalisation of the design and specification for the Works, the Contractor shall submit the Reviewable Design Data to the Service Provider for comment in accordance with the provisions set out in [Schedule Part 8] of the Construction Contract (for the	The Service Provider shall respond within four (4) business days or at such other period of time as may be agreed between the Parties, to ensure the Programme is not adversely affected Failure of the Service Provider to comment on the Reviewable Design Data within the given timescale shall be deemed "no comment".

No.	Issue	Contractor's rights and obligations	The Service Provider's rights and obligations
		purpose of this obligation, all references to Project Co's Representative under Schedule Part 8 of the Construction Contract being deemed also to be references to "the Service Provider"). The Contractor shall liaise with the Service Provider to agree incorporation of the Service Provider's comments on the Reviewable Design Data as set out in the columns of the Service Provider's obligations. The Contractor shall not be obliged to incorporate any comments if these will cause the Contactor to be in breach of the Project Co's Proposals and or the Board's Construction Requirements or place the Contractor in breach of its Construction Contract. Upon incorporation by the Contractor of the Service Provider's comment (or upon the receipt of a "no comment" (deemed or otherwise)) the Reviewable Design Data shall be deemed to satisfy the criteria set out in the columns of the Service Provider's obligations. Any dispute between the Contractor and the Service Provider as to the comments to be incorporated in the Reviewable Design Data shall be referred to the Fast Track Interface Dispute Resolution Procedure. The Contractor can proceed at risk whilst any dispute is being settled.	The Service Provider shall liaise with the Contractor to agree incorporation of the Service Provider's comments on the Reviewable Design Data where the comments meet the criteria set out below. The Service Provider may raise comments on the following grounds: • Non compliance with Schedule part 6; • Non compliance with CDM Regulations; or • Excessive energy use. The Service Provider may raise comments on other grounds, however the Contractor shall not be obliged to incorporate such comments if elects not to for any reason. Any dispute between the Contractor and the Service Provider as to the comments to be incorporated in the Reviewable Design Data shall be referred to the Fast Track Interface Dispute Resolution Procedure.
10.	**Delay**	1. The Contractor shall provide the Service Provider with no less than 3 months' notice of any delay or potential delay (a "Delay Notice") to the Completion Date. 2. Subject to paragraph 3 of this item 10 (Delay) of this Schedule part 2 in respect of the Contractor's obligations, if a Delay	The Service Provider shall use its best endeavours to mitigate costs that it may incur or incurs as a result of any delay to the Actual Completion Date. It shall be a condition precedent to the Service Provider's right to be paid Delay Damages by the Contractor that the

<table>
<tr><th>No.</th><th>Issue</th><th>Contractor's rights and obligations</th><th>The Service Provider's rights and obligations</th></tr>
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<td></td>
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<td>
Notice is issued less than 3 months before the Completion Date or if there is a delay and no Delay Notice has been served, the Contractor shall pay to the Service Provider a lump sum amount to compensate the Service Provider for any costs reasonably incurred as a consequence of the delay capped at the figures set out in the table below:
<table>
<tr><th>Delay Notice Period</th><th>Delay Damages Caps</th></tr>
<tr><td>If a Delay Notice is issued more than 3 months before the Completion Date.</td><td>£0</td></tr>
<tr><td>If a Delay Notice is issued more than 2 months (but less than 3 months) before the Completion Date.</td><td>£20,000</td></tr>
<tr><td>If a Delay Notice is issued less that 2 months before the Completion Date or where no Delay Notice has been served.</td><td>£50,000</td></tr>
</table>
For the avoidance of doubt the amounts specified in the table ("Delay Damages") above shall be the maximum amount payable in respect of each Delay Notice that is served or where no Delay Notice has been served.

3. Subject to paragraph 4 of this item 10 (Delay) of this Schedule part 2 in respect of the Contractor's obligations, the Contractor shall not pay Delay Damages to the Service Provider in the occurrence of Compensation Events, Force Majeure or Relief Events.
</td>
<td>Service Provider shall provide the Contractor with full information within 4 weeks of receiving a Delay Notice from the Contractor of the arrangements that it is putting in place to minimise and mitigate costs including the redeployment or alternative utilisation of staff.

The Service Provider shall substantiate any claim for losses to the Contractor's reasonable satisfaction.</td>
</tr>
</table>

No.	Issue	Contractor's rights and obligations	The Service Provider's rights and obligations
		4. Where the Contractor is able to recover the Service Provider delay losses in respect of Compensation Events, Force Majeure or Relief Events under the Construction Contract (including as provided for under any insurance policy), it shall do so and pass on such monies to the Service Provider.	
11.	**Change**	The Contractor agrees that, prior to proposing any Sub-Contractor Change, the Contractor shall: 1. consult with the Service Provider in relation to the impact of the Sub-Contractor Change on the Service Provider and have due regard to all of the Service Provider's comments in respect of that proposed Sub-Contractor Change; and 2. use all reasonable endeavours to agree with the Service Provider any impact that the Sub-Contractor Change shall have on the performance of the Services or cost of performing the Services;	The Service Provider agrees that, prior to proposing any Sub-Contractor Change, the Service Provider shall: 1. consult with the Contractor in relation to the impact of the Sub-Contractor Change on the Contractor and have due regard to all of the Contractor's comments in respect of that proposed Sub-Contractor Change; and 2. use all reasonable endeavours to agree with the Contractor any impact that the Sub-Contractor Change shall have on the performance of the Works or cost of performing the Works;
12.	**Helpdesk**	Use reasonable endeavours to report all Defects to the Helpdesk excepting defects that do not relate to the performance of its own subcontract obligations. To comply with Helpdesk protocol.	Use reasonable endeavours to report all Defects to the Helpdesk excepting defects that do not relate to the performance of its own subcontract obligations. To comply with Helpdesk protocol. To inform the Contractor of defects within [2] Business Day of defects being reported to the Helpdesk.
15	**Project Co's proposals**	The Contractor confirms it will design and contract the Works in accordance with the Project Co's Proposals.	
22	**Plant Design**	The Contractor shall, acting reasonably, provide the Service Provider with specific design information relating to the redundancy of plant, single point of failure of plant and related access issues, identifying if possible specific items that require consideration by the	The Service Provider shall, where the Contractor has provided it with such information, and where it considers it reasonable and necessary, shall comment on such information, taking into consideration the timescales in the

No.	Issue	Contractor's rights and obligations	The Service Provider's rights and obligations
		Service Provider, in sufficient time to allow the Service Provider to respond.	Review Procedure.
23	**Early Completion**	If the Contractor anticipates that the Actual Completion Date will be earlier than the Completion Date, then the Contractor shall pay an amount to the Service Provider for the unavoidable, reasonable and fully evidenced costs that will be incurred by the Service Provider as a consequence of completion occurring prior to the Actual Completion Date. Any costs payable by the Contractor shall not include any costs that are included within the FM Mobilisation Costs or Monthly Service Payments that are payable in accordance with the Services Contract.	The Service Provider will provide the Contractor with all information reasonably requested by it to evidence (i) its estimate of the costs that it will incur; (ii) that such costs have actually been incurred; and (iii) that such costs do not form part of the FM Mobilisation Costs or Monthly Service Payments that are payable in accordance with the Services Contract.

SCHEDULE PART 3

Interface Dispute Resolution Procedure

Part 1

1. DEFINITIONS

"Acknowledgement Notice" means the written acknowledgment of receipt from the Responding Party to the Referring Party of the Referral Notice.

"Adjudication" means adjudication by an Adjudicator pursuant to this Schedule part 3.

"Adjudicator" means a sole person appointed in accordance with Part of this Schedule part 3.

"Court" means the courts of Scotland.

"Default Interest Rate" means 2% over LIBOR

"Discipline" means profession, trade or discipline.

"Dispute" means any dispute, claim or difference between the Subcontractor Parties arising out of or relating to this Agreement.

"Party" means the party to any Dispute.

"Referral Notice" means any notice from a Referring Party to the Responding Party in writing requiring the referral of any Dispute to adjudication pursuant to the Interface Dispute Resolution Procedure.

"President" means the President or the Vice President for the time being of the Chartered Institute of Arbitrators (Scottish Branch), or if no such office exists within the Chartered Institute of Arbitrators, then the nearest equivalent position within the Chartered Institute of Arbitrators or if no such position exists, or the person holding such office is unwilling or unable to act within 1 Business Day of being requested to do so, the President for the time being of the Law Society of Scotland.

"Panel of Adjudicators" means the panel set out in Part 3 of this Schedule part 3 as may be updated from time to time in accordance with **Part** 2 of this Schedule part 3.

"Referring Party" means, in relation to any Dispute, the Party who refers a Dispute to adjudication under the Interface Dispute Resolution Procedure.

"Responding Party" means, in relation to any Dispute, the Party who is not the Referring Party.

2. SUBMISSION OF DISPUTE TO PROJECT CO

Without prejudice to the right of any Party to refer any dispute to Adjudication at any time, in the event of any Dispute, a Subcontractor Party may submit the Dispute to Project Co,. Project Co's decision shall be binding unless a Subcontractor Party appeals to Adjudication within 15 Business Days. Project Co shall not in any way whatsoever incur liability arising out of or in connection with its decision on the consequences thereof. Any Subcontractor Party involved in a Dispute which has been submitted to Project Co shall co-operate fully with Project Co and provide to Project Co at that Subcontractor Party's own cost all information reasonably requested by Project Co.

3. **SUBMISSION OF DISPUTE TO ADJUDICATION**

Any Dispute may be referred to Adjudication at any time, in which case the procedure below shall apply.

(a) The Dispute shall be referred to the Adjudicator.

(b) The procedure shall commence when the Referring Party gives a Referral Notice to the Responding Party in writing requiring the referral of any Dispute to Adjudication pursuant to this paragraph. The Referral Notice shall:

(i) be addressed to the Responding Party;

(ii) refer to this paragraph 3;

(iii) identify the nature of the Dispute with sufficient detail to enable the Responding Party to identify and respond to the issues; and

(iv) identify at least one and not more than three persons selected by the Referring Party as the Adjudicator.

(c) The Responding Party shall within 3 Business Days of receipt:

(i) give the Acknowledgement Notice;

(ii) indicate concurrence in one of the nominees or propose at least one and not more than three alternatives; and

(iii) identify any other Dispute which is referrable to adjudication which they wish to be determined jointly and concurrently with the adjudication to which the Referral Notice applies.

(d) The timetable for Adjudication shall be as follows:

(i) each Party may submit written statements or responses to the other Party, together with copies of any further documents on which that the Party wishes to rely, such information to be copied to the Adjudicator within 20 days from the referral of the Dispute to the Adjudicator; and

(ii) the Adjudicator shall deliver a written reasoned decision on the Dispute:

(1) within 28 days from the referral of the Dispute to the Adjudicator; or

(2) within such other period as the Party may agree after the Referral Notice has been issued,

provided that the Adjudicator may extend the period of 28 days by up to 14 days with the consent of the Referring Party.

(e) If the Adjudicator fails to submit a final determination by the time required under this paragraph 3(e), the Adjudicator shall be deemed to be unwilling or unable to act, and another adjudicator may, at the request of either Party by notice in writing to the other, be appointed in accordance with **Part** 2 of this Schedule, and the appointment of the previous Adjudicator shall cease unless before the appointment of the new Adjudicator, the appointed Adjudicator shall have submitted his final determination. To avoid doubt, upon appointment of the new Adjudicator, the Dispute shall be referred directly to the new Adjudicator for determination.

(f) The Adjudicator may at any time prior to giving its final determination seek further information from the Parties, and the Parties will use reasonable endeavours to comply with such request.

4. **SUBMISSION OF DISPUTE TO THE COURTS**

All Disputes, to the extent not finally resolved by means of Project Co's decision or by Adjudication shall be referred to the courts of Scotland who shall have exclusive jurisdiction to hear and settle any action, suit, proceeding or dispute in connection with the Agreement and the Parties irrevocably submit to the jurisdiction of those courts.

5. **POWERS**

Any Adjudicator or Court envisaged by this Schedule part 3 shall have the power to open up, review and revise any opinion, decision, certificate, account, requirement or notice and subject to paragraph 4 of **Part** 2 of this Schedule part 3 in relation to the Adjudicator, to determine all matters in dispute as it sees fit.

6. **SUBMISSION OF DISPUTE OF AN EXPERT**

If there is any Dispute as to the terms of the Deed of Novation at Schedule part 4, or to the amendment to be made to this Agreement in accordance therewith either Party to this Agreement or such Deed may require it to be resolved by Queen's Counsel, to be agreed between the Parties, or appointed on the application by either Party to the Dean of the Faculty of advocates in Edinburgh. Such Counsel shall act as an expert, having regard to the timescales and other matters envisaged by this Agreement and may take the initiative to obtain such expert evidence as he considers appropriate and necessary.

Part 2

Appointment and Powers of the Adjudicator

1. INTRODUCTION

The Adjudicator shall be appointed in the following manner:

(a) first, the Parties must choose an Adjudicator in accordance with Part 1 and **Part** 2 of this Schedule; and

(b) secondly, the Parties must conclude an agreement to provide adjudication services with the Adjudicator.

2. SELECTION OF ADJUDICATOR

2.1 Unless the Parties agree otherwise, no person may be an Adjudicator pursuant to this Schedule, unless such person:

(a) has expertise and appropriate qualifications as set out in Part 3 in a Discipline related to the issue(s) in respect of which a Dispute has arisen, or may arise; and

(b) is, at the time of nomination and appointment, currently employed in the relevant Discipline.

2.2 If:

(a) after a Referral Notice has been issued, the Parties are unable to agree upon a person to become an Adjudicator in relation to a particular Discipline within 5 Business Days of the Referral Notice; or

(b) any Adjudicator is unable or unwilling to act, and the Parties are unable to agree upon any new Adjudicator within 3 Business Days thereafter,

either Party may refer that dispute to the President who shall nominate an Adjudicator for the relevant Dispute.

2.3 Following concurrence on one of the nominees in accordance with paragraph 3(c)(ii) of Part 1 or nomination in accordance with paragraph 2.2 of this Part, the Referring Party shall appoint the relevant nominee as Adjudicator.

3. APPOINTMENT OF ADJUDICATOR

3.1 Once the Adjudicator has been agreed or determined, the Referring Party shall, as soon as practicable thereafter, send a notice to the Adjudicator which shall include the following:

(a) the names of the Parties and summaries of the Dispute(s);

(b) copies of the notices, and attachments, issued in respect to such Dispute;

(c) a request for confirmation of the Adjudicator's scale of fees and expenses;

(d) a statement that the Adjudicator's fees and expenses will be paid as provided in paragraph 4.2 of this Part;

(e) a statement that the information disclosed in the notification is confidential and that it should not be disclosed, copied or revealed whether the appointment is accepted or not;

(f) a copy of this Schedule; and

(g) a request for an immediate response.

3.2 If, using all reasonable means, an Adjudicator is unable to be contacted within 3 Business Days, that Adjudicator will be deemed to be unable to act, and another Adjudicator may be chosen and notified in accordance with the above.

3.3 The Parties shall use their reasonable endeavours to ensure that the terms of the contract of appointment of an Adjudicator are agreed within 4 Business Days following confirmation from the Adjudicator of his willingness to act.

3.4 If the Parties are unable to agree with an Adjudicator the amount of his remuneration or other terms of appointment then:

(a) if one Party is willing to agree to what the Adjudicator proposes and the confirmation referred to at paragraph 3.1(g) has been given, such Dispute shall be referred as soon as practicable for determination by the President; or

(b) if neither Party is willing to agree what the Adjudicator proposes, or the confirmation referred to at paragraph 3.1(g) above has not been given, the Adjudicator will be deemed to be unwilling to act and another Adjudicator may be chosen in accordance with the above procedure.

4. **POWERS OF THE ADJUDICATOR**

4.1 The Adjudicator shall, subject to this paragraph and to the agreement of the Parties, conduct his determination in such manner as he shall in his sole and unfettered discretion see fit, provided that he acts impartially and, without limitation:

(a) all written communications to and from the Adjudicator and any Party shall be simultaneously copied to the other Party;

(b) the Adjudicator shall not conduct any oral hearing or otherwise discuss the issues in Dispute other than in the presence of both Parties; and

(c) the Adjudicator may act inquisitorially and may take the initiative in ascertaining the facts and the law relevant to the Dispute.

4.2 The Parties shall each bear their own costs. The parties and shall share the fees and expenses of the Adjudicator equally unless the Adjudicator shall otherwise so determine.

4.3 Any decision of an Adjudicator shall be final and binding unless and until set aside or varied by the Court.

4.4 All matters decided by any Adjudication shall be performed or otherwise carried into effect on the date determined by the Adjudicator or in default of any such determination not later than 5 Business Days after the date of such Adjudicator's decision provided that where the Adjudicator certifies or otherwise decides that a sum (in this paragraph the "**Amount**") is due from one Party (in this paragraph the "**Payee**") to the other Party (in this paragraph the "**Payer**") the amount shall not become due and payable as a debt until 5 Business Days after the day on which the Payee duly demanded the same in writing. The Amount shall bear interest at the Default Interest Rate from the date the same becomes due and payable until the date of payment.

4.5 The Parties hereby agree that the Adjudicator (which expression shall include for the purpose of this paragraph any employee or agent of the Adjudicator) shall not be liable for anything done or omitted in the discharge or purported discharge of his functions unless the act or omission is in bad faith.

5. **REFERENCE TO THE PRESIDENT**

If, as permitted by this Schedule, a Party refers any issue concerning the nomination or appointment of an Adjudicator or other matter to the President:

(a) the Party referring the matter will forward a copy of this Schedule to the President;

(b) the President's decision or determination, or that of its nominee, shall be final and binding upon the Parties; and

(c) the Parties shall meet the President's costs equally unless such person on any particular occasion determines otherwise, in which case, on that occasion, the costs shall be paid in accordance with that the President's decision.

6. **ADJUDICATOR NOT ARBITRATOR**

The Adjudicator shall not act as an arbitrator nor as a mediator, conciliator, expert or in any similar role.

7. **RELEVANT DISCIPLINE**

Once an Adjudicator is appointed, neither such appointment nor any determination of an Adjudicator shall be invalid solely on the grounds that:

(a) the Adjudicator does not have experience in a Discipline relevant or appropriate to the issues raised by the relevant Dispute; or

(b) the Adjudicator does not satisfy any of the requirements of paragraph 2.2 of this Part.

Part 3

Panel of Adjudicators

(a) **Discipline**	(b) **Institution**	(c) **Qualification**
Accountant	Institute of Chartered Accountants	Fellow of not less than 10 years standing
Construction		
Architectural	Royal Incorporation of Architects in Scotland	
Civil/Structural Engineering	Institution of Civil Engineers (Scottish Branch)	
Quantity Surveying/ Project Management	Institution of Chartered Surveyors (Scottish Branch)	
Building Services (M&E)	The Chartered Institution of Building Services Engineers	
Health & Safety	Institution of Planning Supervisors	
Legal	Faculty of Advocates	Senior advocate of not less than 10 years call.

Part 4

1. **EXPERT FAST TRACK DISPUTE RESOLUTION PROCEDURE**

1.1 Any Dispute which relates to matters which are expressly stated in this Agreement to be subject to the Fast Track Interface Dispute Resolution Procedure may at any time be referred direct to an expert without observing paragraphs 2 and 3 of Part 1 of this Schedule Part 3 and the following provisions will apply:

(a) either party may upon written notice to the other refer the Dispute to an expert named by the parties to act as expert who shall be an independent person with appropriate qualifications and experience (the "Reference"). In the event that the parties are unable to agree upon an expert, the provisions of paragraph 1.1(f) shall operate;

(b) the expert shall act as an expert and not as an arbitrator and shall act fairly and impartially. The expert shall have the power to request either party to provide him with such statements (which shall be written unless otherwise specifically required), documents or information that he may in his discretion determine. He may attend the Hospital in connection with the carrying out of his duties under this Dispute Resolution Procedure;

(c) the expert shall have power to revise or overrule any decision or instruction of the parties;

(d) the expert shall, within ten (10) Business Days of the date of Reference, provide written notice of his decision to the parties. If so requested by any party, the expert shall provide written reasons for his decisions within five (5) Business Days of any such request, which request shall be made within five (5) Business Days of receipt of the expert's decision;

(e) the expert's fees shall be payable by such party as the expert may, at his discretion determine and in the absence of any such determination, in equal shares; and

(f) if such expert dies or becomes unwilling or unable to act in relation to this Agreement (or be it a firm or partnership) is dissolved or discontinued or (being a company) is the subject of any bankruptcy or insolvency proceedings then the parties shall agree a substitute within ten (10) Business Days of the service by one party upon the other of a written request to agree upon a substitute expert. In the event that they cannot so agree, or have been unable to agree upon an expert pursuant to paragraph 1.1(a) within five (5) Business Days of their failure to do so either party may request the President or Vice President for the time being of the [British Institute for Facilities Management (in relation to facilities management disputes)], the Institute of Chartered Accountants (in relation to financial disputes) or the Institution of Civil Engineers, the Royal Institute of British Architects or the Royal Institute of Chartered Surveyors in relation to building or construction disputes as appropriate to appoint an appropriate expert. Should the parties be unable to agree upon which appointing body should appoint the expert, the appointment shall be made by the President for the time being of the Law Society of Scotland.

1.2 The expert's decision shall be final and binding and shall be given effect to by the parties.

SCHEDULE PART 4

Form of Deed of Novation (Replacement Subcontractor)

[CONTRACTOR]

and

[SERVICE PROVIDER]

and

[PROJECT CO]

and

[Exit Co]

and

[New Co]

DEED OF NOVATION
OF INTERFACE AGREEMENT

[• Project •]

BETWEEN:

[(1) [ ] (registered under number [ ]) whose registered office is at [ ] (the **"Contractor"**);

(2) [ ] (registered under number [ ]) whose registered office is at [ ] (the **"Service Provider"**);]

[(3) [ ] (registered under number [ ]) whose registered office is at [ ] (**"Project Co"**);

(4) [ ] (registered under number [ ]) whose registered office is at [ ] (**"Exit Co"**);

[(5) [ ] (registered under number [ ]) whose registered office is at [ ] (**"New Co"**)

WHEREAS:

(A) The Remaining Parties and Exit Co have entered into the Interface Agreement dated [ ] 20[ ] and into various Subcontracts as referred to in the Interface Agreement.

(B) Exit Co wishes to be release and discharged from [all/part] future performance of [its] [their] liabilities under the Interface Agreement.

(C) Project Co and New Co have entered into the New Subcontract.

(D) The other parties have agreed to release and discharge Exit Co upon New Co undertaking to perform the obligations and accept the liability of Exit Co under the Interface Agreement and to be bound by the terms of the Interface Agreement subject to as provided for in this Deed.

NOW THIS DEED WITNESSES as follows:

1. This Deed shall be interpreted in accordance with clause [●] of the Interface Agreement.

2. In this Deed, words and expressions shall have the meanings as are assigned to them in the Interface Agreement unless otherwise stated. In addition, the following expressions shall have the meanings now ascribed to them:

"Effective Date" means [the date that New Co is obliged to perform its obligations under the terms of the New Subcontract]/ [the date of this Deed];

"New Subcontract" means the subcontract between Project Co and New Co dated [ ] 20[ ];

"Remaining Parties" means [Project Co and [●]].

3. **COMMENCEMENT**

This Deed shall become effective on the Effective Date.

4. **RELEASE AND DISCHARGE**

4.1 Without prejudice to the accrued rights and liabilities of Exit Co under the Interface Agreement, the Remaining Parties release and discharge Exit Co from performance of obligations under the Interface Agreement arising on or after the Effective Date and from all claims and demands whatsoever in respect thereof.

4.2 Without prejudice to the accrued rights and liabilities of the Remaining Parties under the Interface Agreement, Exit Co releases and discharges the Remaining Parties from performance of obligations under the Interface Agreement arising on or after the Effective Date and from all claims and demands whatsoever in respect thereof.

5. **REPLACEMENT BY NEW CONTRACTOR**

5.1 New Co is granted and accepts all rights and obligations of Exit Co and agrees to perform all the obligations of Exit Co arising on or after the Effective Date under the Interface Agreement and to be bound by all the terms and conditions of the Interface Agreement. [The parties agree that NewCo shall not assume any liability in respect of a matter arising prior to the Effective Date.]

6. **GOVERNING LAW**

This Agreement is governed by the laws of Scotland and the parties agree that the courts of Scotland shall have exclusive jurisdiction to hear and settle any action, suit, proceeding or dispute in connection with this Agreement and irrevocably submit to the jurisdiction of those courts.

IN WITNESS whereof the Parties have executed and delivered this Agreement on the date first before written.

SIGNED for and on behalf of)
[CONTRACTOR])

at
on the day
of 2015
by

Director

Director/Secretary

SIGNED for and on behalf of)
[SERVICE PROVIDER])
)

at
on the day
of 2015
by

Director

Director/Secretary

SIGNED for and on behalf of)
[PROJECT CO])
)

at
on the day
of 2015
by

Director

Director/Secretary

SIGNED for and on behalf of)
[Exit Co])
)

at
on the day
of 2015
by

Director

Director/Secretary

SIGNED for and on behalf of)
[New Co])
)

at
on the day
of 2015
by

Director

Director/Secretary

SCHEDULE PART 5

FM Guide to Design & Construction

IHS LOTHIAN
INTEGRATED HEALTH SOLUTIONS

FM PARTNER

BOUYGUES
ENERGIES & SERVICES

FM GUIDE TO DESIGN & CONSTRUCTION

For

The New RHSC & DCN NPD Project

at Little France.

Draft Version 4.1

October 2013

IHS LOTHIAN
INTEGRATED HEALTH SOLUTIONS

FM PARTNER

BOUYGUES ENERGIES & SERVICES

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1 Introduction

1.1 Purpose

The purpose of this document is to outline the general requirements of Bouygues E&S as part of IHS Lothian responsible for the provision of Facilities Management services for the New RHSC & DCN Edinburgh NPD project.

The NPD process recognises the importance of the Facilities Service Provider providing input to the design and construction of the hospital to ensure the provision of a cost effective service and the effectiveness of delivery against the performance standards. It also focuses on the long term cost benefits of the Life Cycle renewal in relation to the design and quality, to maximise Life Cycle renewal duration, to minimise disruption, ensure ease of renewal. It also aims to reduce maintenance cycles and downtime, increase resilience and ensure repairs can be easily managed.

Bouygues E&S will be responsible for the continued operation of the hospital throughout the concession period. This includes all day to day premise management, maintenance and operational issues as well as the management of the life cycle capital replacement programme.

The NPD contract is based on Bouygues E&S achieving the performance standards and the building being 100% available for Lothian Board use, failure to achieve this can lead to significant financial penalties. This is a major factor in ensuring that the facilities are constructed to a suitable quality standard and that there is sufficient resilience within the mechanical & electrical (M&E) design to minimise the risk of excessive financial penalties.

Bouygues E&S recognises the importance of being fully involved in the design process to ensure that the M&E solutions, the building fabric, the choice of materials take in to account the need to operate and maintain the hospital and to develop the life cycle cost.

This document is an FM briefing guide to be considered by the professional team at the earliest opportunity.

The guide is meant as an aid to the design team to ensure the FM considerations are taken into account. It is not meant to be mandatory, and each design decision should be validated in the usual way. The guide is not intended to replace relevant statutory requirements, Board requirements and specifications, specialist guidance or room data sheets.

1.2 Re-provision of RHSC & DCN at Little France Project

The project is for the design, construction and financing of, and the provision of Hard FM services to the Royal Hospital for Sick Children and department of Clinical Neurosciences at Little France .

The term of the agreement for the provision of the FM services will be 25 years from construction completion and Bouygues E&S will be required to provide:

Hard FM Services

- Estate maintenance
- Energy and utilities management

- Grounds hard maintenance
- [Window cleaning][1]
- Helpdesk service

In addition to the FM specifications stated above, Bouygues E&S will also be responsible for the following under the term of the NPD Project Agreement;

- Life Cycle replacement , and
- Returning the hospital to Lothian Board in the specified condition at the end of the term.

Bouygues E&S intends to self deliver all of the above services with support from local specialist subcontractors.

1.3 Facilities Management Contract for RHSC & DCN at Little France Project

Bouygues E&S as a Service Provider plays an important role in the successful delivery of the NPD model. It forms an integral part of the new RHSC & DCN Hospital contract structure.

A concession for the Facilities Management contract for the new RHSC &DCN Hospital is 25 years; therefore a minor design and construction divergence can result in a substantial and compounding impact on FM operations.

2 Design & Build Considerations

In setting out a design and build strategy for the New RHSC &DCN Hospital project, the following areas require consideration;

- Comply with relevant Mandatory, Advisory documents and Standards.
- Service Specifications and Performance Requirements (from Lothian Board – see Project Agreement Schedule 12 Part 1)
- Project Payment Mechanism (from Lothian Board, see Project Agreement Schedule 14)
- FM Master Planning (FM Centre concept, distribution, logistic, traffic, etc)
- FM Accommodation (Offices, Catering, Workshop, Storage, Waste, etc)
- Replacement Strategy (future life cycle replacement plan)
- Energy, Sustainability and Environment
- Procurement (supply chain, commonality, warranty period, etc)
- Completion and Handover (commissioning data, as build drawings, design assumptions doc, defects liability period, etc)

2.1 Lothian Board Key FM Design Requirements for Soft FM

It is recommended that the designers and the professional teams understand Lothian Boards requirements in term of non clinical support services and take into account such requirements in the development of the new hospital design.

[1] Subject to the Board confirmation (included or excluded from scope of service)

Please refer to Section 3 (Board's Construction Requirements), Appendix B (Interface Output Specifications)

2.2 Architectural Considerations

The design and Build team should ensure that design take into consideration the life of the RHSC &DCN hospital and integrate in their design the features that would make this project easier to maintain and easier to operate for the duration of the NPD concession period.

We will set some examples in the different paragraphs that demonstrate design can reduce the whole life cost of a building.

2.3 Service Specifications

It is strongly advised that the professional team understand the Boards's requirements for FM Services prior to embarking on setting a design and build strategy. Without a full understanding of (or questioning) any impact that the Services Requirements may have upon the D&B solutions will inevitably lead to the D&B scheme being revisited and/or revised.

2.4 Payment Mechanism

The project Payment Mechanism can be found in Volume 2 Schedule 14 of Lothian's 's PA. It sets out Service Failure and Unavailability regimes which link to performance standards both for the D&B and the FM Services.

It dictates availability of project payment (Service Payment or Unitary Payment) and sustainability of the Service Provider. Breaching performance standards can result in an Unavailability of the hospital, leading to non payment from the Board. Sustaining breaches in service parameters can lead to the FM Provider and ultimately the Project Company (PCo) being terminated

The Project Lenders' Technical Advisor (LTA) pays particular interest to this document. It is imperative that the D&B team fully understand this document and that the D&B solutions do not in anyway contravene the project Payment Mechanism.

2.5 Quality and Value for Money

Wherever possible the materials, plant and equipment chosen will be a high quality, sustainable product for which replacement or where specialist contractors required are readily and reasonably obtainable within UK.

Without compromising design innovations and client specifications, common systems and equipment should be applied throughout the design theme. For example, too many different types of light fittings will burden the ongoing maintenance and stocking of spares.

2.6 Whole Life Costing Approach

D&B Value engineering exercises require full involvement of the Bouygues E&S representative at all times to ensure future operational costs (energy, license, etc), maintenance costs and replacement costs are factored in. The total cost of the project is

not just the initial capital costs and whole life costing should be taken into account (building envelop and main M&E equipment are the most expensive items on Life cycle and should therefore be analysed to ensure they are optimised for the project).

Bouygues E&S has a whole Life Cycle modelling tool that allow comparison between various design solutions that include for capital, replacement factor and maintenance for the duration of the PA. This tool should be used during design development.

2.7 D & B Compliance

Compliance with relevant Mandatory, Advisory Documents (HTM, SHTM, ect...) and Standards is a must for all of the required specifications, laws and regulatory mandates, including foreseeable (by foreseeable, we mean changes in laws that are more likely to come up during the construction period) future change in laws.

Where the above are not possible and derogations are granted to D&B, such derogations are to be passed down to Bouygues E&S and other FM operators and captured in the final agreement.

2.8 Redundancy, Resilience and Availability

Single point of failure is to be avoided. The design should incorporate resilience for failure mode scenarios (i.e. stand-by units); built in redundancy to cope with maintenance /breakdown services (i.e. N+1).

All system designs should incorporate a fail safe mode (if not provided, a derogation is to be requested to and provided by the Trust to ensure the penalties are mitigated).

Consider built-in availability for any plant that impact on service delivery by having smaller capacity but increased number (i.e. 1 = 1+1).

Allow for adequate isolation (valves, blanks etc) in the distribution system. In the case of critical systems, main supply (water, electricity, gas, IT, etc) a ring distribution system with necessary isolations to enable isolation and back feeding system should be designed in.

Utilities networks and systems should be provided with emergency arrangements such as supply headers/emergency storage. Appropriate isolation of valves/switches and a facility for the connection to a mobile plant/supply is essential in the event of unexpected, prolonged down time.

Bouygues E&S requirements related to equipment and systems redundancy, resilience and continued availability are included in Appendix 3.

2.8.1. Zoning

The hospital should be divided into separate zones (by areas of priority level, criticality level or security level) so that security /access, building services (mechanical, electrical and IT) and FM servicing strategies can be controlled and confined to appropriate areas.

Zoning should be configured so that an area can be totally isolated and confined without impact or dependent on other areas.

It should also enable maintenance and repair activities without disrupting Board activities and enable local disablement to minimise potential deductions.

2.9 Energy, Environment and Sustainability

The project requires that the Design and Construction Energy Target is achieved and energy management systems are in place throughout the operation period, failing this penalty deductions will apply. To be in a position to meet this obligation, it's of paramount importance that the RHSC &DCN Hospital is provided with adequate energy metering and targeting means, designed and installed in from the outset (Please see the Board's requirements for metering as set out in Volume 3 construction requirements.

2.9.1. Metering

D&B should propose a Metering strategy explaining and detailing how they will achieve the compliance with the PA.

9 months prior hand over to client the D&B team will issue to Bouygues E&S an energy target report simulating 1 year (typical) of energy consumption by type of fuel and for each meter.

Energy metering is expected to be of a pulse type, link to Energy Management System (EMS) and at the very least, capable of interfacing with any standard energy management module for the purpose of recoding and raising alerts where thresholds have been exceeded.

Bouygues E&S recommend the usage of split DBs to ease the metering strategy and in order to reduce the quantity of supply cables in the distribution.

Metering and Sub metering will be sufficient to support the following reporting obligations;

- Consumption in Gigajoules by Area in Gj/m2 for each type of energy in each month
- Total energy consumption, broken down by type of energy for ward/department, the kitchen, the individual retail units and the rest of the hospital (final level to be agreed).
- Weather data recorded for each month
- Compliance with CIBSE TM39: 2009 (Building Energy Metering)

Data will be collected from all energy sources (including oil) and subdivided into the main usage areas, either by the EMS or separate data loggers, and automatically forwarded for predictive and historical analysis (15 min data) and early warning for trend deviations and specified targets.

2.9.2. Consideration for Sustainability Design

The following, if viable for the project, should be considered;

- CHP plant
- Ventilation with Heat Recovery
- Solar Hot Water System
- Rain Water Harvesting
- Ground Source Heat Pump
- Ground Water
- Geothermal Exchange
- Use of recyclable materials and/or from sustainable source

2.9.3. Consideration for Energy Savings

CHP

The Central Heat and Power plant has many advantages;

- Better energy efficiency than traditional boiler house
- Reducing the need of Generators
- Ease of distribution for mutli-site
- Better integration with renewable energy

HVAC

Use of variable speed drives on motors and fans for optimising local environmental needs and assist in energy savings and (also applicable to other engineering systems);

Motorised external louvers linked to BEMS system to interact with HVAC system (to minimise heat exchange when not required.

BMS controls monitoring/controlling a maximum number of zones for the HVAC system based on building orientation and loads.

Separate controls for individual spaces, where feasible.

Use of occupancy sensors and CO2 monitoring for system that enables automatic shut down during non-occupation.

Ventilation system (tempered air/cooling) with setback facilities for relevant departments during non-occupation.

Heat recovery system – recuperator, heat wheel recovery, pipe coils, (provided the energy recovered is greater than input energy).

Lighting

Ideally an intelligent lighting management system that can be embedded in the BEMS or separate system (only from an open protocol system) that is web based and accessible remotely to manage the entire system. Design to include automation for occupancy, like PIR sensors, dimmers, daylight sensors, timers etc. It should also have the capability to store and provide historical information for inclusion in the monthly reports.

Daylight Harvesting

Consider sky dome, roof lights, and skylights for use of borrowed daylight for interior spaces which enables savings from use of daytime lighting. See also 5.1 Roof.

Glazing

Solar heat gain control tinted glass, low emissive coating (preservation of transparency);

High performance low -e glazing (gas filled < or = 0.5W/m2) – reduce solar gains to building in summer and heat loss from bldg during winter

All tinted glazed should be from a standard colour, in order to guaranty that it will be possible to find the same tinted glazing for the duration of the PA.

Reduction of Air Filtration

High quality seals in windows and doors

Automatic/mechanical blinds sensitive to solar gains and /or controlled by BMS

Ingress and egress should be fitted with automatic door and window closers linked to BMS system in order to reduce the air leaking during heating and cooling periods.

Green Roof

Incorporation of a green roof has a wide range of environmental and economic benefits in particular their insulation and cooling properties, ability to significantly reduce rainwater runoff from roofs; their value is acknowledged in promoting biodiversity and habitat in built-up areas lending a distinctive image to a building.

However, green roofs require maintenance and there must be safe access to work on the roof with access to water and electricity to ensure maintenance can be carried out safely and watered during dry periods.

The warranty on the waterproofing of the green roof should be agreed prior the start of the construction (waterproofing warranty over the duration of the PA plus hand back requirement usually offer better Life Cycle Cost)

Planting and Composting.

Use of plants and trees is recommended not only for ornamental purposes but also for

- to provide solar shading
- as a security barrier
- boundary definition
- assist with reduction in pollution
- Low maintenance

Plumbing

Use plumbing equipment that are efficient and water saving;

- Dual or low flush toilets (6L cistern)
- Sensor taps for hand wash basins
- Rainwater harvesting for feeding the toilets cisterns
- Easy to remove and/or replace for the maintenance team

2.10 Replacement Strategy

The design team is required to formulate a future replacement plan as part of D&B strategy for all relevant building fabric, M&E services plant and equipment including all furniture and fittings. The aim is to avoid disruptions to New RHSC &DCN Hospital activities during the planned life cycle replacement work.

Sufficient hard standing areas for plant handling during replacement should be provided. This area to be sited for easy access into plant room and without having to create additional opening or dismantling of plant room enclosure.

Consideration should be given the positioning of cranes for removal and replacing of major plant/equipment whilst the New RHSC &DCN Hospital is in operation.

Scaffolding is expensive and labour intensive and not acceptable over the long term of the contract for maintenance work. It is generally more economical to use cherry picker or lift /access equipment if required.

Major Plants Equipment

It is preferred that all major plant and equipment can be transported via FM service lifts or lifted directly outside the building/plant for the purpose of removal and replacement.

If not possible sufficient space around the plant to allow dismantling and on the way to outside should be provided. New installation cannot be assembled on site as that usually voids any manufacturer warranty.

Minor Plants Equipment

The plant rooms' layout should allow access to replace/repair small parts of plants (pumps, motors, etc...) around each plant equipment. A pathway in the plant rooms should be clearly marked on the drawings and on site, to allow safe access to each plant and to be able to move any parts within the plant room.

Bouygues E&S is expecting to see the following details in the plant replacement strategy;

- Routes for all type of plant and equipment (small, medium and heavy equipment), from their permanent location to external of the building or extraction point.
- Specific material required to extract/move each type of plant equipment
- Exact location for cranes and detail of crane (model and manufacturer) for each type of plant equipment
- Each heavy/wide plant equipment like, boilers, hot water cylinder, hot & cold water tanks, chillers, AHUs, Solar heating, Generators should be treated separately.
- Plant room layout with pathways from plant location to main ingress and egress.

2.11 Procurement & Supply Chain

2.11.1. Construction Procurement

It is advised that on-going maintenance and lifecycle replacement and opportunity is taken into account when negotiated with construction suppliers. Certain major suppliers such as lifts & escalators and major M&E equipment will provide a better contact value when taking whole life contract into account (the installation, maintenance and replacement).

Bouygues E&S is required to have the opportunity to review relevant construction tender specifications and any Value Engineering proposals by a supplier or a subcontractor and validate it for its suitability for FM service delivery, including availability, service continuity, OpEx and lifecycle implication, etc.

Local supply chains are preferred. It is not just supporting the day to day operations of the Hospital but also building sense of belonging into the local community.

2.11.2. Suppliers' Warranty & Maintenance

Construction tender packages will, as a minimum, include maintenance and full servicing as required by the manufacturer (during the construction period and until the client's hand over) so as not to void the warranty.

The warranty should only start after hand over and the warranty period should be in agreement with the maintenance provider or client in case of equipment and material not maintained by the maintenance provider.

Bouygues E&S is to be included as a name in the warranty document and any guarantee provided by the manufacturer/installer is required to be backed by reputable insurer.

Bouygues E&S recommended suppliers standards can be found in Appendix 3

2.12 Commissioning, Testing and User Training

Training is required to occur well in advance of building handover, during the testing and commissioning (T&C) phases. Bouygues E&S's operational staff will, following the T&C and on receiving the appropriate training will themselves, in the presence of the subcontractors, operate plant/equipment, carry out functional checks and test for alarm conditions till they are satisfied and confident for the handover.

The procurement contract, as necessary, should allow for training of key personnel on-site to acquaint them with the local environment. Certification of individual should be one of the training requirements to satisfy client and Bouygues E&S quality assurance requirements.

Full training needs to form part of the build costs package for ALL elements including M&E, fabric and external (e.g. BMS, Fire Alarm, Intruder Detection, CCTV, lifts passengers realise, Façade panels /render, windows, doors, drainage, interceptors, etc).

All mechanical and electrical installations will be fully commissioned, tested in service and witnessed by appointed Bouygues E&S staff, test certificates and O&M manuals provided and FM staff trained and at operational condition prior to handover from construction colleagues in order to achieve and demonstrate design performance.

In order for Bouygues E&S to have all the appropriate staff present for the training we request a training schedule to be issued to Bouygues E&S 6 months prior the start of the T&C.

Note 1: Prior to ANY testing/commissioning taking place, the contractor is to provide a clear and specific Method Statement, determining;

- how the test is to take place.
- what relevant information is being used (drawings, specs, etc).
- what systems or part systems are being tested.
- relevant mark up drawings.
- expected test results or parameters.

All such method statements are to be issued for review at least 5 working days before test is scheduled and to be signed off by the Bouygues E&S responsible Manager.

A form shall be provided at the time of the test and signed by all parties present. This shall be resigned by all parties following the witnessing of the test along with the results.

The Contractor should note that failure to comply with this request may result in the system(s) not being accepted by the Bouygues E&S Responsible Manager.

Note 2: Prior to ANY training taking place, the contractor is to provide a clear and specific Method Statement, determining;

- how the training is to take place.
- provide the relevant information is being used (drawings, manuals, etc).
- duration of the Training
- qualification requirement for the engineer to be able to operate the equipment.

All such method statements are to be issued for review at least 5 working days before test is scheduled and to be signed off by the Bouygues E&S responsible manager

2.13 Completion and Hand Over

A full package of electronic (electronic format should be compliant with appendix C&D of our Project Handover Record Information guide) will be provided compliant with Construction and Design Management regulations (in case of transmission of an electronic format only, a confirmation and acceptance from the client is requested), H&S at Work Act, Building Codes and Standards and relevant trade organisations such as CIBSE, IEE, etc. It should as a minimum include record drawings, asset registers, O&M manuals and manufacturers details to allow the asset /infrastructure /items to be operated, maintained, tested, repaired, renewed and disposed of appropriately.

It is suggested that the documentation be organised in a library reference format to enable immediate accessibility by newly trained staff, sub contractor staff and head office support staff. D&B should engage with Bouygues E&S for set-up of library reference system that should be standardised for all future new build projects.

2.13.1. Spares & consumable

Essential spares and consumable recommended by supplier/manufacturer for each equipment as a minimum requirement for the warranty period are to be procured as part of construction packages, to be left in maintenance store and available for Bouygues E&S maintenance staff and warranty subcontractors.

This should include items such as fan belts, lamps, ceiling tiles, oil, filters, etc

A full listing of all Critical spares, spares and consumable (that should include filters sizes and reference for each AHUs and EPA filters) should be provided as part of the O&Ms.

2.13.2. Builder

The entire Hospital should be subject to a thorough builder clean, including plant and equipment, prior to the clinical clean.

2.13.3. Record Drawing

It is imperative that the D&B team have in place a comprehensive as build drawing for the entire hospital, including M&E, internal and external infrastructure.

The record drawings are to be provided in hard copy and electronically in Auto CAD format that links to a database containing information such as room numbers, plant IDs, etc

See our Project Handover Record Information guide

3 FM Master Planning

FM solutions need to be taken into account from the outset when setting master planning for the project. FM solutions include;

- FM accommodation and link
- FM traffic, access & egress
- FM services approach

3.1 Hard FM Centre

The concept of FM Centre is the hub of the FM service delivery that forms an important link in supporting the functioning of the RHSC & DCN Hospital facility.

In the designing and configuration of space, an efficient layout should house the support service team to effectively support the New RHSC & DCN Hospital functions.

The aim of the designer for the Hard FM Centre should be integration of the following:

- FM Offices (including meeting, training, helpdesk, etc)
- FM Welfare facilities (rest rooms, changing room, canteen, etc)
- Receive and Distribution Centre (loading dock, break-up areas, etc) – this will be shared with the RHSC & DCN loading dock area.
- Stores (internal & external)
- Estates Waste area
- Equipment wash facilities
- Workshops
- Parking for contractors
- Energy centre (internal or external building)

3.2 FM Technical Requirement

Bouygues E&S would like to ensure that some minimum requirement are follow by the D&B;

- Floors; In technical spaces (plant rooms, medical gases, electrical cupboards), the floor shall be painted (epoxy paint) prior any plant installation.
- Data, D&B will provide data cabling (voice and data) in all FM offices, Energy Centre plant spaces, etc (See our room data sheets for more details), the data cabling should be Cat 6 cabling.
- Key system; Bouygues E&S need to have a different key plan from the Board in order to avoid any possible access to non Bouygues location. (See our room data sheets).

3.3 FM Spaces Requirements

It is important that designers give due consideration to FM spaces requirements for all Hard FM areas. Bouygues E&S will undertake the majority of maintenance in house

Failure to provide sufficient FM spaces will hinder the FM operations, leading to shortfalls in service performance standards and resulting in payment mechanism deductions.

It is also advisable that the Bouygues E&S's own (FM) support spaces are verified to ensure overall spaces have been taken into account and are sustainable.

Please refer to Appendix 1 (HFM Schedule of Accommodation) for Bouygues E&S requirements related to Hard FM areas for the New RHSC &DCN Hospital.:

Please note the IHS Lothian Consortium may also require on site accommodation

3.4 FM Adjacencies

The design should if feasible include the provision of a dedicated service corridor (can be share with Food Services, Soft Services and Stores) at basement level running from the dedicated FM Service Yard, to dedicated FM service lifts (minimum 2 lifts for redundancy and service down time and clean and dirty separation(if required), sized to support largest equipment expected to be transported by lifts, ie boilers, heat pumps,...) servicing each floor of the building (including technical floor or roof if plant are on the roof), to ensure operational efficiency, security of the Hospital and keep back of house movements separate from New RHSC &DCN Hospital staff and visitors.

The corridor should be of sufficient width to allow the use of motorised vehicles moving trolleys in bulk, being able to pass each other. No obstacle should obstruct the corridor (like fire break doors – should be integrated to walls - or equipment mounted on the wall and protruding from the wall (ie, fire alarm panels, emergency buttons, etc.

If fire doors can't be avoided in the FM corridors, they should be re-enforced with full face and edge protections, and similarly low and medium level post to direct trolley to the centre of the doors, held open magnetically with failsafe close in the event of a fire. These corridors should have heavy-duty wall protection at low, middle and high level. The sketch below is a recommendation of good practice and final agreement on the FM corridors design should be agreed prior FA.

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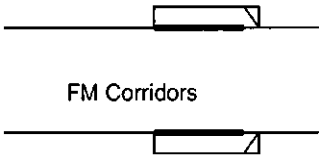
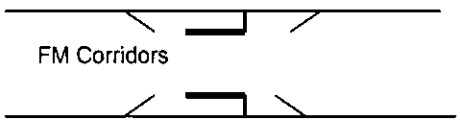
Recommended



Acceptable



Consideration should be given to New RHSC &DCN Hospital Food Services facilities (kitchen, restaurant, café, etc) to be in the vicinity to allow for hygienic transportation of supply and food products.

The close adjacency to a dedicated service corridor of the post room, equipment room, cleaning store would allow efficiencies to be gained in cleaning. Cleaning office space within the cleaning stores is required for storage of documentation, for administrative work (reconciling goods receipts/invoices) and communicating with suppliers.

Location of main workshop and stores for maintenance staff should be adjacent or within the proximity of FM management office.

A drench shower facility and drainage should be provided adjacent to the chemical storage space or within the FM Centre

3.5 FM Management Areas

If possible having both IHS Lothian Hard and Lothian Board Soft FM Management areas within close proximity would be ideal to enhance Project Co and client integration (but without compromising confidentiality between the parties)

The SPV management team should be housed with the FM management team.

3.6 Plant Services (Hard FM) Areas

There is a need to provide supplementary storage space in the plant room space for storage of consumables for e.g. bulbs, strip lights, step ladders etc.

A main store for spares/consumables should be located adjacent or in proximity of the main workshop facilities. The main store space will include front space for receipt of goods delivered and for trade staff to collect spares/consumables from the storekeeper.

A dedicated cleaning space within the mechanical and electrical workshop should be provided. This space will accommodate a cleaning agent, kerosene or diesel oil, (240 litre) drum and industrial sink with air and water provision and will be screened off from the main area. An oil interceptor shall be provided for this space within the drainage system.

First aid boxes and Eye wash stations are required to be installed in all plant rooms and spaces required.

Lifting beams or similar should be provided to accommodate chain block pulley above heavy duty plant for carrying out repairs or renewals. Lifting beam should be extended up to plant room external entrance or to any landing where sufficient space is provided to lift/move safely the plant equipment. D&B will pay particular attention to roof plant room in order to avoid any steps that create difficulties in the daily operation.
Equipped with adequate lighting both general and escape, adequate provisions for carrying out basic maintenance e.g. service outlets, water supply, and drainage. Small power supply

sockets with necessary IP protection should be provided near plant for use of additional lighting and power tools.

Provision for channels with grating for drainage; and sump well in ground floor, basement plant rooms and underground service duct with float operated sump pump and alarm linked to BMS. Ensure that no drainage outlets are below plant equipment and out of reach for maintenance (they should be all accessible from the main corridor)

Provision for a wall stand to accommodate a plant room log book near the entrance.

Provide all data (data and voice) cabling in the FM spaces to a central data room within the FM offices.

Schematic drawings of each services within the plants should be provided in all the plant rooms in a suitably constructed frame behind clear plastic and secured to the wall.

Provide appropriate all safety and warning notices (including noise, PPE, etc.) inside and outside each plant room ingress and egress.

Provide adequate extinguishers in all plant rooms, all on a secure panel with audible alarm.

3.7 Help Desk Areas

This should be within the FM management offices but with its own enclosure to minimise noise. Digital call display should be installed and visible to all to reflect Helpdesk call information. A wall of the Helpdesk area should be a white wall and the area should have good natural light.

3.8 Receive and Distribution Service yard

- The area should encompass the New RHSC &DCN Hospital expected deliveries and outgoing traffic, sufficient space for lorries and Bouygues E&S's supplier vehicle. A complete studies of traffic flow and turning circle should be issued and agreed with the client and Bouygues E&S prior FA.
- Designated car parking spaces for at least 4No LGV for use of maintenance provider's subcontractors are to be provided.
- Lighting in the RCD should be controlled by dusk to dawn sensors and PIR controlled.
- A washing reel arrangement with main water pressure should be allowed for the purpose of washing equipment and plant during maintenance and repair (with portable pressure washer). The floor base will have adequate slopage and/or drain channels to ensure no ponding occurs.
- A secured, open-air enclosure (top cover) with a dual compartment tank arrangement, water, air supply, interceptor drainage facility for chemical cleaning of heat exchanger, coils etc will be provided. This enclosure is to be accommodated within the FM compound adjacent to workshops. An overhead beam and pulley arrangement would be required
-

3.9 Access and Egress

3.9.1. Vehicular Access

The design should provide a separate and dedicated service road for large delivery vehicles to mitigate risk of accidents. Road and accommodation dimensions should be

sympathetic to delivery vehicles in respect of turning circles, reversing, tail lift heights etc. As regular movement is anticipated it would be appropriate to have traffic calming devices e.g. speed breaker humps, rumble strips to ensure speed limits are observed and operatives are not at risk.

Cars, cycles and pedestrians routes to and into the site should maintain adequate and safe separation of these flows (preferably by physical means), if not completely possible clear vertical and horizontal signage to be in place to mitigate the risks.

A service road of sufficient width and strength with clear headroom of at least 5m for the entire route (i.e. clear of tree branches, lighting on columns, etc) to allow large waste, furniture, materials & equipment supplies and catering delivery vehicles safe access to delivery points.

These vehicles will deliver catering, furniture and building materials and remove waste (typically 26 tonne arctic Lorries)

3.9.2. Traffic Management

The service route should be segregated from pedestrians and other vehicular traffic. It is preferable to have a dedicated service road separate from patients, staff and visitor vehicle access road and pedestrian pathways. Allowance for a turning circle will be made (if physically impossible, sufficient physical mitigation to insure safety should be put in place). The service road should allow vehicles to deliver outside /adjacent to storage areas to comply with H&S manual handling regulations. Bollards (or removable bollards if needed) should protect building elements from vehicle impact.

Sufficient space to house the oil tanker delivering to the Energy Centre and the BOC O2 tanker delivering to the VIE plant without unduly disrupting the traffic flow to and from the service yard.

3.10 Maintenance Access

Access should take into account the Work at Height Regulations, Manual Handling Operation Regulations, the Workplace (Health, Safety and Welfare) Regulations, and therefore service access should be as far as reasonably practicable safe without Personnel Protective Equipment (PPE), via permanent means, and provided with suitable lighting. The use of static lines in new and refurbished building is not acceptable. Work at height regulations require ladders can only be used as a last resort and are not justified for new builds.

Egress should be considered for escape purposes and also in removal of plant/equipment for repairs and renewals. Safety consideration must be considered whilst not only working but in escaping during emergencies for e.g. when working on roofs, underground plant rooms or service ducts.

Assembled tower scaffolding is expensive in labour time and not acceptable over the long term of the contract. It is more economical to use cherry picker /access equipment.

The design will address the access strategy for maintenance & life cycle replacement and window cleaning.

Ensure that all internal and external walkways to plant & equipment and around plant & equipment is suitably lit to allow Bouygues E&S to carry their maintenance 24/7.

3.10.1. External Window and Façade Cleaning Access

An access strategy for cleaning and maintaining the following elements should be developed from the outset of the design and issue to Bouygues E&S for validation prior Financial Close.

- External cladding / render system / façade panels (cleaning, maintaining & renewal) – Render is not the prefer option to Bouygues E&S and it is not acceptable on the ground floor level, for cleaning and vandalism issues.
- All ground floor level to be suitable for vandalism resistance (impact resistant and will be treated for anti-graffiti. Preference should be given for suitable and life long standing material, like bricks,, etc.
- Roof perimeter detail maintenance
- Rain Gutters cleaning and maintenance
- Window cleaning and maintenance
- Whenever the strategy requires the use of movable access equipment:
- Access routes for cherry picker or other access equipment will be identified and validated.

The access equipment weight including operator and cleaning equipment are to be established and checked against the strength of access routes. If there is a need for cleaning equipment and machinery (eg cherry picker or scissor lift, depending on height and reach), flooring should be able to withstand between the weight of the equipment. Particular attention should be paid as most of the grass or planted areas are not suitable for receiving a cherry picker.

3.10.2. Access for External Building & Tall Structure (masts, lamp posts, etc)

Required to be developed at outset of design so operational costs can be developed. The following are typical elements:

- CCTV cameras on building
- Façade mounted External light fittings
- Mast mounted lighting fixtures
- Mounting brackets, masts, poles, etc

An access route for a cherry picker or other safe means (mans safe are not recommended but where no other means of access can deliver it can be considered)) will be provided with the ground having sufficient strength to support unit and operatives without damage to surfaces and landscaping.

3.10.3. Roof Access

Acceptable roof access is to be provided (stair case as minimum, FM lifts if any plant equipment are to be on the roof, if the roof is covered in roof tiles or zinc type roof then it will be acceptable to have only a roof hatch access with fix ladder and anchor points so visual inspection can be carried) as it is a major risk for Bouygues E&S and impacts on H&S and performance deductions over the length of the contract. The requirements of the H&S regulations, workplace health safety and welfare regulations pertaining to maintenance operatives /subcontractors and work at height regulations require a safe method of working.

Bouygues recommend if the roof is to be accessible for maintenance that perimeter of the roof should be above the 1.1m so no specific safety line has to be maintain and replace over the period of the contract.

Lighting of the roof footpaths has to be provided.

3.11 FM Services Approach

The FM services approach and best FM solutions for the New RHSC &DCN Hospital will be developed and continuously fined tune in order to meet New RHSC &DCN Hospital requirement and expectation during the bid process.

The IHS Lothian D&B team will include Bouygues E&S and its subcontractors during the development in order to ensure consistency with hospital design.

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4 Specifications Guide

4.1 Structure and Superstructure

4.1.1. Basement Construction

Watertight concrete construction: any water ingress is potentially a source of infection as well as a problem for the availability mechanism. The basement will be constructed to BS type 3 standard.

Paint systems used as part of the permanent structure and which will need re-coating in the life of the concession must be designed to be accessible and ventilation systems must be capable of extracting safely any fumes.

Basement plant must have access doors with sufficient room to accommodate the largest plant item that need to be replaced during the PA.

Provide water sump with auto mode sump pump and float alarms at regular intervals or areas suspect to water leakage/ingress, linked to BMS.

4.1.2. Undercroft

If drainage/pipeworks and cables are installed in the undercroft, it need to be accessible (not permanently, it will be considered as confined space and accessible to Bouygues E&S staff under permit to work). The design of the undercroft should include 1.7/1.9m high walkway to be able to inspect and attend any defect that can occur on the drainage and pipeworks.

The undercroft need to be naturally ventilated in order to be accessible.

4.1.3. Expansion Joints.

Joints must not run through sensitive clinical areas such as operating theatres, intensive care unit, etc. This will help in infection control measure and also preventing spread of contaminations.

Joints are to be designed to last beyond the concession period. Exposed surfaces should not pose trip hazard and should be maintainable. They must be able to be cleaned in the event of contamination.

Avoid running joints through roof plant room, as leakage from plant and equipment will find it's way to occupied spaces below. If this is not possible the plant layout will avoid wet plant being installed over the joint.

4.1.4. Floor & Floor Drains

Pre-cast concrete drainage channels are preferred to gullies in areas that require regular floor washing or where there is a constant discharge from equipment or plant, are more desirable. These areas include plant room, kitchen, waste disposal/collection and 'walk in' fridges and freezers.

Shower areas should be done with waterproof concrete as preferred solution and drainage penetration properly sealed, also please ensure the sloop are done properly and large enough to cover the shower areas (areas should be greater than the curtain limit, to avoid water spillage in the rest of the bathroom).

All drainage in the Generators plant rooms and boilers rooms (dual fed) will be connected to an oil interceptor (link to BMS).

4.1.5. Lift Shaft and Lift Pit

Lift shaft should be fitted with lighting and small power socket outlets. Lighting will assist in lift and lift shaft inspections (carried out every six months). Small power will enable minor repairs that require power tools. Interlock safety push buttons shall be provided to prevent any inadvertent lift operation whilst carrying out shaft/pit maintenance.

Lift pit should incorporate gravity drainage with oil/grease trap if necessary. If this cannot be achieved then the pit should be equipped with sump pump and level alarm or leak detection system.

Lift shafts to be concrete construction. Where front wall left down for lift car construction these to be filled with block work. Plasterboard is an unacceptable form of construction due to the wear and tear on these areas.

Individuals lift shafts for multiple lifts will be provided with the necessary fire protection interface. Lift shaft and pit will be provided with fixed steel ladder steps.

4.1.6. Stairs

Avoid having maintenance access doors opening into landing areas (unless area is large enough to maintain escape routes whilst work in progress)

Stair treads: Screwed fix edge protection is preferred rather than adhesive type. It will allow repair to be done without having to close stairs for adhesive to set.

Lights to be wall mounted at low level for easy access.

Staircase lighting to be wall mounted not on soffit especially at landing with heights in excess of a storey height

Power points at each landing to facilitate cleaning

4.1.7. Balustrading

Consider using galvanised metal handrails on the exterior and painted metal guardrails in the stair cores.

4.2 Building Envelope

4.2.1. Roof

General guidances on roofing are;

Roof to be of pitched construction wherever possible. High quality standing seam roof cladding to be used with minimal joints and capable of being dismantled in small section for ease of roof top plant to be replaced during the concession period.

Flat roofs should be carefully designed to ensure good drainage, and should be water tested for leakage and ponding prior to handover. Adequate sealing should be provided around roof space openings for flues, extraction fan outlets, vent pipes etc and must be tested for leakages. Flat roofs should be paved, from roof access to the different plant equipments and roof plant rooms, to ensure no damage can occur to the roof membrane during maintenance operations.

Perimeter safety railing and safety anchors must be provided. Services will be supported on paving slabs and provision for steps across services will ensure safety and prevent drainage to pipework insulation.

Roof membrane sealing around anchorage points (for abseiling) and fixtures for window cleaning equipment tracks must be tested for leakages.

Chimneys and flue uptakes should be provided with protection for weather, bird penetration by means of a cowl or damper arrangement capable of opening by effluent.

Bird protection measures will be provided for plant /equipment located in the open roof space.

Plant/equipment located in the open shall be provided with weather protection housing and adequate lighting for carrying out maintenance and repairs safely.

Adequate lighting and non-slip walkway should be provided. Illuminated light switches should be located at every roof entry points.

All items installed on the roof should be safely accessible and protected from weather element for maintenance and replacement.

Handrails are to be provided where there is a falling hazard. Safety/Life line and safety hook are not the preferred option to provide safety measure to staff. Also if they are required as handrail can't be provided, they need to support the permanent equivalent of 2 staffs (in case of rescue).

4.2.2. Roof Plant and Pent House

Plant should be located as far as possible from noise/vibration sensitive department. All roof-mounted plant should be grouped into a single location and contained in a weatherproof penthouse that will not be adversely affected by helicopter downdraft.

All roof plant rooms should be fully contained to prevent leakage to floor below. Provision for ceiling beams and pulley arrangement shall be provided for maintenance and renewal of heavy-duty component/equipment.

All plant rooms whether internal or external should be adequately lit to ensure maintenance can be carried out safely 24 hrs a day

Time delay lighting, with override provision and two way switch arrangement where more than one access/exit are provided in plant rooms. Main plant rooms shall be provided with

terminal outlets linked to the BMS and access to hard FM element of the helpdesk software.

Fixed steps and/or walking platform should be provided at plant room level change, space dividers and across services.

Anti slip paint coating or colour sealer is required for all plant room floors.

A log book wall-shelf will be provided near the entrance of each plant room.

Telephones for internal use only will be provided in all plant rooms.

Suitably sized permanent asset number labels should be provided on every bit of equipment following the agreed numbering system.

Telephone masts and associated equipment should be located and secured in accordance with guideline to ensure no risk to personnel working in plant room and/or interference to equipment.

Adequate clearance is required around fixed plant for maintenance and cleaning activities, particularly noting withdrawal /removal requirements for all coil bundles, heater /cooling batteries and all capital replacement works.

Where practical plant should be designed such that it can be dismantled and removed using the lifts or alternatively where a lifting beams need to be used the lifting and landing areas need to be able to support the anchorage point and weight of the equipment transported.

Schematic drawings of all plant in a particular plant room should be provided in a suitably constructed frame behind clear plastic and secured to the wall.

4.2.3. Main Building Access/Egress

External Entrance/Exit Doors to provide air lock preventing air draughts; special attention when the access strategy provides for multiple accesses at a given time, creating paths for strong air draughts: waste of energy, lack of comfort, etc.

Ingress and egress should be fitted with automatic door on movement sensors (linked to BMS for fault) in order to reduce the air draught/leaking during heating and cooling periods.

Emergency access doors for ambulances to be automated doors with two sets of doors to reduce the air leakage/draughts

No emergency/fire exit should give directly on car park or other used areas, if on public space then clear signage and ground marks with audible alarm when the door is operated.

4.2.4. External Walls

Quality assurance of the air barriers to prevent air infiltration is essential to meet the energy performance and BREEAM certificate.

Consider from the outset the means of access for cleaning, repairing and part replacement of curtain walling, walls, windows, drainage pipe work etc.

External cladding / render system / façade panels and construction can have major cleaning and maintenance cost implication for Bouygues E&S. Where cladding is proposed, the maintenance strategy (annual cost and accessibility) is to be considered as part of the design process. Render is not acceptable on the ground floor level, for cleaning impact resistance and vandalism issues.

All ground floor level to be suitable for vandalism resistance (strong impact resistant) and will be treated for anti-graffiti. Preference should be given for suitable and life long standing material, like bricks, wood panels, etc.

Access routes for cherry picker or other access equipment need to be identified and validated as part of the access and cleaning strategy, same routes and means of access should be used for the repairs and maintenance of the external walls (abseiling and anchor points are not the recommended option and should only be used if it can't be achieve differently). Preference should always be given for cradles, cherry pickers.

4.2.5. External Doors and Windows

Avoid using different type/property of glazing in a building. Single specification i.e. tinting, colour rendering, double/triple glazing, size, etc. for all glazing. This will make keeping spares and responding to repair more efficient. Standard colours only should be used, as any special colour will be difficult to match later when patching is required.

Preference for supply good quality aluminium frame with cold bridges gap. No PVC frame windows.

Where curtain walling is provided, solar shielding must be taken into account as well as the cleaning of the curtain walling.

Windows in internal courtyards/atrium/ceilings and skylights to be fully accessible for maintenance and cleaning

Window designs should avoid acute angles.

Tilt and turn windows may not be acceptable in certain clinical areas therefore will need to be cleaned externally, access of theses windows should be part of the cleaning strategy.

Provision must be made for cherry pickers for the doors sizes (part of the cleaning and access strategy).

All atria, internal glass used on walkways etc need to have a provision for access for cleaning and maintenance incorporated into the design.

All double/triple glazing units to be hermetically sealed

Windowsills and high level ledges both internally and externally to be avoided or designed to slope. Where external ledges occur then avian deterrence devices should be allowed for.

Blinds, curtains, window fixtures, services and rails should not obstruct window operation or the cleaning and maintenance process.

Consider windows with built-in- blind provision for purpose of hygiene.

Provision for window opening restrictors and locking arrangements with suited key (if needed).

Provision of trickle vents should be allowed for marginal conditions (seasonal change) and where external noise levels are unavoidable.

4.3 Building Fabrics

4.3.1. Internal partitions

Internal partition should be made from block works for all fire zones separations and all plant rooms

Internal partition in plasterboards should ensure that wherever required they have enough strength to support fixing of small equipment (like mirrors, boards, TV screens, ect...).

Where required, hanging of shelves should be done with noggins or reinforced plasterboards. If noggin are the preferred building choice, drawings with noggins mark-up should be issued to all parties.

4.3.2. Doors

Internal doors should be suitable for purpose, and capable of resisting wear and tear and suitable for the application.

Internal doors, where needed, should be held open by magnetic door releases (chain link are not permitted). As these doors are normally open consider them to be finished to blend in with wall finishes and save the cost of veneer doors for areas that matter.

Where the air pressure regime does not allow magnetic releases consider alternatives for positive closure (hydraulic swing arms with adjustable delay).

Door Frames;

- Preference for steel door frame as this as a better standing against damage and better life cycle. If wood frame, to be MDF or hard wood, the frame should sit on a steel shoe to avoid water penetration. If not possible then the frame should sit 5mm above finish floor level and sealed with a anti-bacteria sealant (product to have a warranty of 10 years).
- If required, door frame protection (steel plate cover type) on all fire doors in FM corridors and eventually entry/exit to department or services.
- Heavy duty hinges should be used with rising buts where appropriate. Cranked hinges should not be used

Door Leaf;

- Standardised door size will assist in speedy repair and replacement.
- Vision panels secured by flush beading and not raised above face of door as these damage easily.
- Door edge strips to be such that they resist damage
- Doors should be sufficiently heavy duty to ensure minimum maintenance
- Door/hinge protectors (cylindrical steel tubes with rotate able rubber pulley wheel) on either side of door frames.
- Door stops (wall fixture) or other means of restrictive door swing to be provided to avoid collision of door furniture with walls when opening.

Design recommendation (to be further discuss and develop with D&B);

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Locations	Door types	Door leaf	Protection	Door Frame	
				Steel frame	Wood Frame
Public Entrances	Preference for revolving doors over sliding doors (if possible).	Aluminium & Glass	High impact and tempered glass with stickers for visual deficient people	X	NO
A&E Entrances	Preference for automatic sliding (automatic swing doors acceptable).	Steel or aluminium (wood not recommended)	Full height protection (steel or aluminium preferred), if with vision panels, tempered glass	X (preferred)	X (acceptable if protected)
Medical Departments (main entrances,	Preference for automatic sliding doors (automatic swing doors acceptable).	Wood	Preference for full height and edge protection.	X (preferred)	X (acceptable if protected)
Public corridors (fire doors)	Hold open doors	Wood	If inserted in walls, one leaf protection, if not, full height and edge protection	X (preferred)	X (acceptable if protected)
FM corridors (fire doors)	Hold open doors	Wood	If inserted in walls, one leaf protection, if not, full height and edge protection with side post to divert trolleys	X (preferred)	X (acceptable if protected)
Deliveries areas (FM and pharmacy)	Preference for automatic sliding doors (automatic swing doors acceptable). If no automation, then a hold open system should be provided	Steel	High impact protection and full height protection	X	X (acceptable if protected)
Storages areas	Impact resistant	Wood	High impact protection and full height & edge protection	X	X (acceptable if protected)
Medical areas (where bed/trolleys doesn't go)	Client requirement	Wood	Preference for half height impact protection		X
Medical areas (where bed/trolleys goes)	Client requirement	Wood	Full height/half height impact protection		X
Medical offices (Consultants, Doctors, Secretariat)	Client requirement	Wood	Preference for half height impact protection		X
Other general Offices	Client requirement	Wood	None		X
Cupboards & risers (Electrical, cleaning, etc)	Preference for doors blending within the area	Wood	Preference for half height impact protection if opening in corridors, if no, no specific requirement		X

4.4 Finishes

4.4.1. Walls

Wall finishes should be washable with detergent solutions at 6 monthly intervals. This is essential for infection control purpose particularly where there is paint finishes. Acrylic eggshell emulsion is preferred. All internal walls should be smooth and painted with a durable finish. Specialist areas such as laboratories with more frequent wall washing should receive appropriate consideration and suitable specialist coatings. Preference is for a finish or coating that does not require painting and can be washed without any detriment to the surface finish.

The Lothian Board staff will be responsible for all internal redecoration and wall cleaning

The finishes used should be maintainable through periodic repair and not require complete restoration following a repair to achieve a consistent appearance with the surrounding area

Consideration should be given to ease of touching up the finish where damage occurs for this reason we would suggest a limited palette of colours are used.

The interior designers should recognise that due to the frequency of washing we would strongly urge against the use of wallpaper

Catering areas, particularly food preparation areas, should be laminated or FRP (Fibreglass Reinforced Plastic) panelling from floor to ceiling (preferred to tiles since grout may harbour bacteria), and there should be no voids, which could harbour insects. We would suggest that kitchen areas to receive cladding such as Altro White Roc or equivalent to be adhesive bonded to the wall surface

Splash areas around washbasins, baths and showers should be tiled or with hygienic wall protection. All the room protection for baths, showers, instead of just the splash area make the project cheaper to run on the long term.

Consider block work with dense plaster (impact resistant) for all heavy circulation routes. Pay particular attention to any odd shape cages, trolleys and bins and design wall protection to suit.

Wall protection should be sufficiently robust to withstand direct impact by all moving items. Avoid brittle plastic and adhesive fittings. Preference is for ABS mounted on (recycled) wood or high density rubber base.

Plant room walls and other auxiliary space walls should be block work to allow future retro fittings.

All wall surfaces are required to be capable of being scrubbed clean without damage, and be capable of supporting wall-mounted furniture, which will have to be relocated and replaced. In areas, which are subject to damp conditions, such as bathrooms, Sterile Processing or other areas using steam, moisture resistant plasterboard must be used. Lightweight block work is more durable. Where prefabricated walls are used lightweight concrete construction is preferred for pods as this will be more durable than galvanised section walls. These need to be coated or finished with durable PVC cladding.

All accessible surface mounted pipe work, cabling, together with fixing brackets, clips should be avoided or under trunking. Where such services are "boxed in" great care will be taken to ensure the absence of vermin and rodent access

All corridors adjoining junctions and crossroads of junctions should be curved if possible on plan or as a minimum standard be bevelled with cut away corners to minimise damage from collision of wheeled trolleys etc

The use of ceramic wall tiles is generally not acceptable in service areas, unless specified by client this needs to be discussed with Bouygues E&S taking account of the potential to damage, longevity of life including edge and corner protection integrated into installation, using waterproof stain resistant grouting.

Full provision in all departments and corridors (FM and public where trolleys and beds are passing) of wall protection at low/high level with corners protectors, barrier rails, hand rails.

Skirting should be coved (with the use of cove former) floor to wall finish throughout the clinical/medical areas (for infection control purpose), if not, derogation from client will be required.

Stainless steel and laminate tabling and benching should include rear and side up stands, taking account of wall protrusions as appropriate

Provision of high standard wall insulation or higher for energy savings.

4.4.2. Floors

Consider under floor heating for main entrance. It will help to eliminate moisture and slip hazard. Please ensure if underfloor heating is used the design of zones is coordinated with concrete slab joint and the floor covering joints.

Consider implication of future replacement of floor coverings, floor screed should remain intact when sheet materials are removed.

Catering areas, particularly food preparation areas, should be rubberised floor (tile grout may harbour bacteria)

Avoid timber skirting. Upturn vinyl skirting on coving is easier to keep clean.

Bouygues E&S's opinion should be sought before any choice of flooring surface is determined and finalised

4.4.3. Hard Flooring

Application of hard flooring (wood, vinyl, ceramic and tile) needs to be discussed with Bouygues E&S at the earliest opportunity for life cycle purposes.

We need to consider whether vinyl should not be used as it is not biodegradable and future legislation will impose levies for destruction.

Linoleum whilst biodegradable requires light buffing which is less labour intensive and disruptive,

Our preference would be the new generation of rubber floorings (manufacturer to be selected with architect). These floors require no periodic maintenance, and have a 25 year plus life cycle provide excellent acoustic absorption. It requires virtually no screeding or welding. The range includes anti slip for wet areas and anti static for operating theatres and ICU. Only surfaces that are slip resistant and safe should be selected

Our second preference would be for Marmoleum a derivative of linoleum therefore biodegradable and treated to remove the need for strip and polishing, floor only requires light buffing. It has better acoustic absorption than vinyl and is manufactured in Scotland

From experience, treated vinyl which does not require polishing gives a poor visual impression of cleanliness and should not be used. However if traditional vinyl is chosen it should be laid in accordance with manufacturer's instructions onto a suitably prepared floor. Following application of the adhesive the vinyl should be laid using a roller in order to expel

any air trapped between the vinyl and the structural floor. This will maintain the even wearing characteristics of the vinyl, avoid any visible patterns caused by the comb toothed trowel and ensure the floor can be effectively cleaned.

Non slip floor, Bouygues would prefer that rubber flooring with raised dimples is not used as it is difficult to clean and requires more frequent replacement.

All welded joints shall be of the highest standard to avoid wear, water ingress and tripping hazards and shall be of a matching colour. All inlaid floor patterns are to achieve the same qualities

Expansion joints shall be waterproof and finished at floor level

All flooring should be coved up the wall to prevent build up in corners. The use of specially designed profiles or covet fillets is recommended. Seamless transitions between floor and wall finishes are preferred; the creation of ledges or 90 degrees angles should be avoided

All floor levels should be carefully managed, including gradual falls for drainage where necessary especially shower/trays floor where anti slip floor shall also be considered and care must be taken to avoid water seepage/leakage into surrounding areas

Where ceramic floors are selected, great care should be given to aspects of safety, slip resistance, levels, grouting, coving, ledges, wear and tear, durability and maintenance. The provision of suitable movement/expansion joints to match the structural joints in the building and also to control the differential movement between the substrate and the tiling layer, must be provided.

Particular attention should be paid to adequacy of slope of floor in shower rooms, bathrooms, mortuary, with provision for channels and removable gratings in plant rooms, etc

Grease traps are to be fitted to all outlets within floor drains in kitchens

4.4.4. Soft Flooring

Soft floor covering, particularly carpets should be avoided also we recognised that offices and family hotel can be fitted with it.

Bouygues E&S agreement should be sought as to the suitability of carpet in specific areas, avoiding all areas with a potential of a high degree of spillage of food and bodily fluids. The fixity of the dyes used should be such that normal cleaning materials and disinfectant should not affect the colour. We would suggest the use of dark multi patterned carpets being selected in order that small stains are not unsightly

Preference for carpet tiles in offices, and where used to be heavy duty with stretched joints where appropriate

The under surface of the carpet in areas where there is the potential of biological spillage should be impervious to fluids and the joints welded to give a continuous barrier

Carpets to be suitably laid and fixed to avoid rucking

Carpets to be of the quality to withstand daily mechanical vacuum cleaning and twice yearly steam cleaning and frequent spot treatment of chemical and biological spills

Carpets to be laid in conjunction with a suitable underlay fixed with recommended manufacturers fitting system. Anti-bacteriological under lays and treatment may also be needed in some areas

Particular attention should be given to those areas where floor coverings have to be cut to allow access to floor sockets etc, ensuring that the fixings around openings avoid fraying and excessive wear

4.4.5. Floor Accessories

Particular attention should be given to where floor accessories are fitted which may interfere with floor levels and safety

Doormats should normally be provided adjacent to every external door depended on the traffic types and volumes certain mats will require specifically constructed mat wells allowing mats to be flush with surrounding flooring. Such doormats are to be suitably finished flushed with the surrounding floor, be suitable for wheelchair access and for use by people with any shoe type.

Mats will remove and retain general grit, dirt, dust and will attract excess moisture during wet weather from footwear and trolley wheels

Stair treads to have permanently fixed system of anti slip /anti trip nosings and surface treatment manufactured by an approved specialist

All floor surfaces installed during fitting out process must be adequately protected and guarded after laying, and sealed as appropriate prior to handover.

4.4.6. Ceilings

Tiles should be smooth, cleanable by hand and steam cleaners and preformed. Minimised the different type of ceiling tiles used for the whole project.

Where there is MF plasterboard, paint should be cleanable. Sufficient access hatches must be designed into solid ceiling. Hatches should be of a drop hinge type and is operated by engineer key.

Where drop down plain ceiling areas are a feature design for departmental entrances etc these will be carefully coordinated with service design to avoid fire dampers etc being sited above these ceilings. If this is not feasible ceiling tile grids to have indicators where key items e.g. isolation valves, fire dampers etc are installed with label on wall (white Trafalite with black lettering) denoting item/location

Ceilings that incorporate ceiling grids and lay in tiles to be adequately supported, allowing suitable space for ceiling voids and ease of access to voids. (Simple T track drop in system has our preferance with 600mmx600mmx12mm tiles)

Light fittings to be integrated into ceilings avoiding grease and dirt traps. Specialist areas to have easily cleaned sealed lighting units, which are water resistant and have low maintenance requirements. Renewal of luminaire to be carried out internally from room and not from void space.

In single storey buildings for critical use (operating theatres, ICU, etc) ceiling void containing services should be provided with walkways or crawl platforms with access to the fittings/fixtures.

Colour coded indicator labels/tags to be provided on ceiling tiles where reset/isolation items can be found in the void (valves, fire dampers etc).

4.5 Furniture, Fitting and Equipment

Portable fire extinguishers should be recessed into walls and provided with anti theft alarms linked to anchor point.

Assisted hand rails/bars should be fixed to solid walls or walls should be designed to accommodate these facilities. Noggins have proved to be ineffective and difficult to place accurately during second fixing, preference for glass fibre re-enforced plasterboard to minimised second fixing errors and long term benefit of the building.

Avoid integral design of for example, dish washer, fridge, freezer, etc, into kitchen areas.

4.5.1. Sanitary Appliances

Services to sanitary units to be easily accessible for maintenance without causing undue disruption to wards and departments

Sanitary ware should be of a neutral colour capable of withstanding heavy duty and long term use. It must be capable of withstanding cleaning 3 times a day with chemicals without discolouring or tarnishing

Standardise fittings wherever possible.

Consideration should be given to stainless steel sanitary ware in areas of particularly heavy usage or where vandalism is a potential problem (kitchen, plant rooms and theatres hand wash stations)

All sanitary furniture required to be manufactured from heavy-duty thermal plastic material to minimise breakages

No pop up waste should be allowed

Screw fix for bath panel is preferred rather than clip fix or adhesive type.

All Public area washrooms to have hand free flush valve toilets and taps.

Cubicle partitions required to be construed of a solid core material (laminated if needed for architectural but not internal wood laminate as the partition base) that will allow easy cleaning and ease of replacement

Drain connections should be of a generous size and include rodding access

Dual flush (short/long) cisterns shall be provided to facilitate water conservation

Electrical hand dryers of a concealed type shall be provided in toilets serving public areas

4.5.2. Signage

To be clear and easily read avoid small typefaces and consider visually impaired people

Consider clip on type for the ease of future name change and departmental changes.

Signage package to include all health and safety signs required in plant and equipment rooms.

Specific consideration should be given to pay stations and third party income areas e.g. cafe, restaurant, vending etc.

4.5.3. Common Areas

Building design, installations, fixtures and furniture to comply with requirements of the disabled users of the premises;

- All entrances, atria, lifts, public corridors and public toilets are required to have a cleaners room practically positioned (Domestic equipment from clinical areas should not used to service public areas).
- Vending machines should be located in recesses if possible, provisions for utilities and drainage will be allowed for.
- Public telephones to be recessed and have wheelchair access and acoustic enclosure.
- Adequate power points at regular intervals should be available on both sides of corridors, stairwells, lift lobby's, entrance halls to ensuring cleaning can be undertaken and to avoid tripping hazards.
- Spare plug in points (RJ 45) for mobile security cameras in public areas.
- Room to house the cherry picker (Internally or externally) for use in the atrium and external facades must be provided.

4.6 M&E Services

All main equipment manufacturer warranties should be agreed prior FA with the designer and M&E contractor.

4.6.1. Main Water Supply

There should be a minimum of 2 main incoming water supplies, with independent main isolating valves and meters (meters to be link to EMS) preferably diametrically opposite and connected to a ring main with necessary isolations for use during maintenance and emergency repairs from mains failure.

Emergency water filling/supply point should be provided to give extra back up in case both mains fail. This should be co-ordinated with the disaster Recovery Plan.

4.6.2. Gas Main Supply

Minimum of two main supplies from separate rings is required (metered and link to EMS).

Provide pipe/ rote for catering use to avoid interruption to supply, that included metering link to BMs for recharge to the catering supplier.

Provide ring main with necessary isolation as required.

4.6.3. Main Sewer Outlet

Locate manholes for run to main sewer outlets from public areas externally to the building. Access for jetting and jetting facilities (vehicle, power tools, water supply) should be easily reached.

The Health &Safety file should include a full commissioning report after all debris, blockages and repairs have been attended to.

4.6.4. Main Heat Source & Energy Generation

All heat source and energy source should be located at ground/basement level if possible (noting this is premium space), with a planned level access away form high traffic areas and emergency access routes. This should allow for crane access if plants are located inside compound, or on different floors.

Dual fuel (i.e. gas and oil) facilities should be considered from the outset in accordance with HTM and SHTM requirements.

Heating system design must be 100% redundancy capable for long term shut down (i.e. for insurance inspection, replacement and retro fitting).

4.6.5. Natural Gas Installations

Install gas valve emergency stop buttons for every gas burning appliance and at entrance/exit of the rooms where gas is used. They should be clearly visible, labelled and be linked to alarm system and BMS. Instructions for reset should also be provided to enable reset by user.

4.6.6. Waste, Soil & Overflow Pipework

Ensure adequate allowance of easily accessible rodding eyes

All non fixed head showers should be anti-syphonic to eliminate cross infection.

Vent pipe should be connected to all basins and baths waste outlets.

All manholes, if it is possible, should be located externally to building footprint. Rodding eyes and jetting access should be conveniently located away from public areas. Cold water outlet, should be available for jetting, in the vicinity

Internal manholes should be located in the areas that no deduction or little deduction applies when the areas become unavailable, such as cleaner cupboard, etc.

Avoid internal manholes in rooms or clinical spaces, consider locating them in courtyards along corridor away from entrance, doors, etc.

It is important to consider ingress and egress implications during maintenance works, when designing location of manholes.

Consider sweep bend (long radius) to help with drain clearance.

Maximise floor channels and gratings with appropriate grease traps in spaces where floor washing is regular such as, plant room, kitchen, catering, mortuary, pathology, etc.

4.6.7. Heating

If CHP; the system should be provided with dual burning fuel (Gas and Oil).

If Boilers, our preference are cast iron chambers for the long term benefit, no aluminium chambers.

All pumps to be direct drive in-line or vertically mounted (no belt driven) for all circuits. All pumps to have inverter controls (integrated or not).

Stand alone pumps, avoid integrated twin pump arrangement in single volute casing.

Variable speed pumps to incorporate auto rest facility to original setting following spikes, power failure etc and/ or remote reset via BMS.

Pressurisation units should have built in redundancy for pump and expansion vessel. Pumps to be adequately sized to prevent short cycling and hunting.

Provision of spare coupling/valve arrangements in heating HWS of individual blocks/areas to facilitate connection of mobile plant or isolation in case of failure. Principle of zoning to be agreed with Bouygues E&S.

Provision of safe access and anchorage points for flue inspections, testing points and repairs.

Boiler automation-burners automation built in intelligence-software logic/controls (boilers to match demand, flue analysis, efficiency factor, trends).

Radiant panels should be the preferred option to LST radiators as benefits from cleaning, damage and energy efficiency can be realised. Radiant panels is to be located centrally (if possible) away from adjacent to windows.

Avoid use of TRV where radiators are installed due to increase in maintenance and tampering. Adequate zonal control via BMS is required.

4.6.8. Domestic Hot Water Production

To be designed and installed in zones to enable progressive installation, commissioning, future isolation and reduce the risks in use of having whole system failure.

Adopt a traditional flow and return system, avoid using trace heating as problematic to repair and impacts on energy usage.

Blending valves are costly to purchase and maintain. FM would support alternative engineering solution to eliminate them but still provide 43^{0}C hot water (38^{0}C for showers and bidets) at outlet and without compromising Legionella risk.

Instantaneous hot water heaters in non-clinical areas occupancy 9am– 5pm (office/admin blocks) is acceptable e.g. independent office blocks areas. Include for stand alone water softening cartridge with isolation valves

Sanitary fittings - Taps - inclusive of TMV (Thermostatic Mixing Valves to TMV3 DO8 standard) 'Rada'

Water treatment low maintenance – UV, ultra-filtration, RO, silver ionisation (avoid chemical storage/handling/injection)

Showers – Auto dump 'Safepurge' two-pipe shower units is the preferred option and should be installed with drain water heat recovery.

Provide risk assessment certification by external (to sub-contractor) Competent Person Legionella, Water regulations, Building Code and Standards

Heating and Hot water services should be designed with adequate built-in stand by redundancy to ensure that a failure in any single element of the system will not have an impact on clinical activity

Use of direct gas fired heaters could be considered where peak demand occurs e.g. independent blocks – offices, family hotel.

Alternative technology such as use of ionisation system to minimise Legionella with compliance levels and therefore depress DHW temp (flow/return) allowing reduction in boiler capacity, fuel consumption and insulation levels

4.6.9. Cold Water Services

Cold water tanks and booster pump sets supply from ground level are acceptable, but booster pumps sets to have n+1 pumps. The supply should be zoned (minimum of 2 zones) with separate tanks to allow chemical cleaning, commissioning and fault rectification whilst still continuing the supply.

Storage Water Tanks - GRP tanks, compartmentalised for maintenance/isolation. Water tanks to comply with water regulations. Provision of temp sensor linked to BMS.

Automatic controls (level and alarms for level and overflow) for secondary and/or satellite tanks.

Preference for smaller diameter pipe work in copper rather than ABS or PVC due to use of solvent/curing time and also due to inadvertent damage.

Water softener auto regeneration programme to conductivity and not time or volume based, softener to be BMS link for alarm and regeneration signal.

Provision and placement of an adequate size salt saturator and connected to water softener units for transfer of saturated solution preferably by gravity or by transfer pump.

Prefer main supply pipework above ground to be in galvanised steel. Where ABS or other PVC is used ensure in built metallic layer to provide rigidity/strength and sufficient support to prevent sagging in any section. Solvent based joints to be avoided at all costs.

Provide risk assessment certification by external (to sub contractor) with Competent Person for Legionella and Water regulations.

4.6.10. Cooling Production

Roof top plant (AHU, Chiller plant) to be housed with weather and avian protection.

Chiller system design capability to accommodate alternate refrigerants to meet in-pipeline legislation (if any) for future adoption (retrofit).

Close circuit water chillers should be used with air cooled condensers. Possibility to have free cooling supported.

Chillers quantity to meet N+1 redundancy, each capable of supporting 100% building cooling load if 2 chillers only. Preference for Turbocor technology for chillers as the running cost are low and noise levels are lower than standard chillers), with possibility to add heat recovery to chillers. BMS link for alarm and running time for each chiller.

Where independent cooling units are used (for e.g. a computer room and PABX) these should be provided by a 100% redundant split system, and monitored on the BMS.

If use of heat pumps system, please ensure they are n+1 and all link to BMS.

4.6.11. Air Handling Units (AHUs)

The number and diversity of AHU's should be determined early on to ensure a balance between practical considerations, capital costs, replacement and maintenance. Bouygues E&S recommend 1 AHU per operating theatre in order to ensure sufficient safety. All theatres AHU to hold twin motor fan system for redundancy and safety (EFM penalties are high if theatres are not running). Each AHU should be equipped with it's own independent control panel, and the system to have automatic switch over in case of failure, alarms to report to BMS.

All AHUs should be installed on a plinth with sufficient space all round for maintenance or removal of coils (heating or cooling, for example, etc). AHU fan/motor preference for direct drive and inverter driven

Other AHUs to have adequate built in redundancy for different failure scenarios. However where bank of AHUs for multiple critical areas then a standby AHU with capability to link-up to either unit during emergency.

Grills and diffusers should not be rivet fitted but screw fixed for removal and internal cleaning.

Install air pressure balancing damper in side wall where required.

Kitchen grease filter should be located away from hot appliances for safety reasons. Avoid using carbon filter, if it is at all possible (costs).

Air handling ventilation systems (supply and extract) should be designed specifically for critical departments. This will ensure that unavailability will only apply to single functional area/unit when an AHU is down.

All plant and connections should have isolation valves, separate to commissioning valves.

Heat recovery facilities should be included only if it can be certain that the benefit of energy efficiency can outweigh revenue costs.

Avoid having acoustic lining inside AHU and ductwork to avoid particles being carried when lining material disintegrates.

Clean Rooms design to ensure easy access within room for renewal of Hepa filters

Setback and optimisation features to be included as a general.

Tinned Copper fins on tinned Copper tubes.

4.6.12. Ductworks

AHU ductwork design to HTM 03 standards. Careful consideration regarding the access for cleaning ductworks and avoid high level duct installation for extract, if needed allow for working platform and access ladder where required. Design with slow bends in place of tight ones, smooth aerodynamic branches and transitions will reduce fan power requirements. No straight angles are allowed in any ductworks installation, that helps the cleaning and reduces risk of bacteria growth.

Duct fire dampers, VAV controls, etc, should be easily accessible for resetting and repair/replacement. For all treatment areas controls should be in corridors to allow maintenance whilst the area is in use.

Ductwork design - openings at regular intervals (DW 144) and of sufficient size for entry for cleaning ductwork, inspection/renewal of fire dampers Where practical duct runs to be designed to avoid occupied areas to minimise disturbance during maintenance activities

4.6.13. Fire

A addressable fire detection system should be provided that enables rapid identification of fire zone in alarm condition

Repeater panels should be strategically located at the main reception, security control room and help desk

All detectors and sounders must be labelled with their relevant address.

Design team should encourage, influence and seek early agreement from relevant fire authority.

All gas/oil burners should be equipped with local fire suppression and fusible link to safety devices.

Sprinkler system – Pressurised system and concealed heads and/or interchangeable heads in public areas. Sprinkler system to be provided with bell zone check system to enable automatic testing.

Fire/smoke dampers those are linked to alarm system should be reset automatically on cancellation of alarm. This is to avoid interruptions of New RHSC &DCN Hospital operations during maintenance inspection and testing

Provision of override facility for AHU plant and fire doors, fire dampers etc shut down during fire alarm tests.

Programmable software for fire alarm system to isolate alarms and fire doors from remote.

Door magnets for hold-open position and linked to fire alarm system

Smoke extract system – ductwork fireproof

Access to wet mains isolation if valves are located away from drive paths

Vertical escape route (hatches) from underground service routes are required to be located away from drive paths. Where unavoidable necessary warning signs and alarms should be provided.

4.6.14. Lifts & Escalators

There needs to be dedicated FM clean and dirty service lifts (bed size) servicing all buildings and floors including roof top plant rooms at regular intervals. These lifts should be key/swipe card controlled by FM staff only. In the event of the patient bed lifts not being available for use the clean FM lifts can be used as the contingency and the movement of FM goods staggered to use the remaining FM lifts accordingly

Preference Traction lifts, Acceptable to have Machine room less lifts IF the provision for the last floor landing is large enough to accommodate 1.5m landing for Lifts engineers services plus a normal corridor for visitor and staff circulation.3D protection is required at all floors

All patients/visitors and beds lifts to be by pair. All lifts to be compliant to comply to EN81-1, 81-70, 81-71, 81-72 & 81-73.

All lifts landing to have different coloured floor to mark on the landing areas (same width as the lift opening by 1.2m deep).

Dedicated Theatre lifts. Consideration given to swipe card control (or with key override as second option).

All patient/beds lifts must have door sensors safety edge (all high and 3D detection), be able to transport a bed (mini 1.8 opening doors and 2.5m long), have a LED displays in the lift advising direction and floor level for hard of hearing patients and voice information for patients with visual impairment.

All Lift buttons of side and type with Braille commands and located at low level to comply with DDA, they need to be vandal resistant.

Two way communication between helpdesk or switchboard and lift motor room in the event of person trapped, if not responding the system need to allow for direct communication to lifts manufacturer call centre too.

Cab key pad and communication equipment to be flush mounted with tamper proof fixtures

Dedicated FM goods lift by way of a pass key/swipe card to access all the plant rooms levels (including roof if plant is on the roof level) without steps. Lift only go to plant level by activation of a key switch

Provision of keypad arrangement to hold lift at desired level or as temporary lockoff to ensure priority use and/or enable patient/goods transportation.

Cab internal to be heavy duty stainless steel finish for low maintenance

Steel door(s) gauge to be armoured to withstand damage from patient trolley, meal and other goods transport equipment (for FM and Bed lifts).

Lift design to incorporate emergency release gear for manual operation of lift hand wheel/brake release arrangement sized for one-man operation. Preference for auto control release, which eliminates above release arrangement and can be done from lobby space external to plant room (Kone, Otis and Schindler Lifts have incorporated this system in their technology which also eliminates the need for a lift plant room).

Internal rails for patient trolley protection at low and medium level

Software communication capability with BMS Remotely accessible by liftscompany for remote diagnostic, resetting and upgrade of control software.

Floor/department location plate, capacity and type etc – engraved and flush mounted plates (to be coordinated with the site signage in order to keep it the same)

Multiple lifts to have provision for use as emergency lifts with override for changeover.

Provision of energy saving features in overall design – variable frequency drive motor, soft start/landing, microprocessor controls, traffic movement - logic controls

Cab light to be LED technology and internally accessible, diffuser cover easily removable for cleaning purpose. Mini lighting to be 100lux at floor level (even) across the floor.

Lift manufacturer should be more than 20 years in UK business in order to provide reliable experience and guarantee all lift parts will be supplied for 10 years after being installed.

Lift manufacturer/installer to provide 4 sessions training in entrapment release between 3 months to client hand over date, and issue name's certificate, So Bouygues E&S is able to operate the lifts from the date of client's hand over.

4.6.15. Electrical Services

The design, installation and on-going operations of the electrical systems should be totally resilient;

- Preference for a HV ring with an open point
- Transformer provision n+1
- LV substations interlinked for emergency power supply.
- LV supply dual feed to critical units (operating theatres, ICU, etc.)
- HV supply configuration should be of a ring main type, avoid single supply.
- LV substation to be interlinked for backup power supply
- Grid supply to be backed up by emergency gensets.
- Provision for load shedding facilities within installation to enable discriminated supply in the event that a generator is taken out of service.
- BMS link in case of main failure, interlink failure, auto change over failure.

Design consultant shall liaise with manufacturer/supplier, to provide a study of earth loop impedances and consequent disconnection times when running on a generator.

HV/LV transformers should be designed to be 100% redundancy. Systems should be configured in such a way that changeover from one transformer to another can be achieved with minimum or no power interruption.

Preference for air cooled and resin transformer due to maintenance benefits. Oil cooled transformers are not acceptable.

MCCs arrangement should be equipped with a safe and simple manual by-pass facility for the transferring of power. The arrangement will be crucial in the event of the failure of automatic switching.

Preference for MCBs and CBs to be equipped with kWh meter/recorder to enable the monitoring of energy consumption for each circuit.

Distribution boards and electrical control cubicles should be located to minimise disruption to ward and department day to day activities during maintenance. DBs should have dual metering to ensure compliance with metering strategy.

Ensure all distribution boards are rated at 120% of initial expected electrical load to allow for future growth

All sub- circuit distribution boards must be marked to identify, the source of supply, the rated power of each sub circuit, the areas covered by the distribution circuits and the design rating for the distribution board

Avoid surface mounted conduit and floor mounted power outlets.

HV supply should be from two separate incomers and internal supply via HV ring main.

Switchgear SF6 or vacuum to be used wherever possible

Provision of motorised ACB and MCCB

Provision of surge protection, PFC, harmonic protection, dedicated tripping power supply units for LV section and all necessary controls, alarms, interlocks, instrumentation, safety and tripping/closing supply devices

Switchboard cabling top entry and exit to facilitate inspections and maintenance

Adequate clearance to be provided in HV/LV sub stations at front, rear and below ground to carry out maintenance, upgrade and renewals

Specialist or sensitive computer equipment should be provided with "clean supplies". These power outlets must be clearly marked to distinguish from normal supplies. A separate earth connection must be provided for such installation.

Provision of ground fault detection system at final circuit level to be considered on the basis of a risk assessment v/s cost (in view of KPI and penalty deductions).

4.6.16. Emergency Power

Generator sets (genset) design to allow for HV generation (depending on location). Generation system design to conform to BS regulations. Design of the gensets should allow Automatic Mains Failure (AMF) and mains synchronisation (G59) electrical with REC for test and operational purposes.

For multiple genset provision the design shall allow for removal of any single genset without inhibiting or interruption of delivery of emergency power. Removal shall mean for major or minor repairs or replacement of prime mover or alternator or both. Removal or replacement of genset shall not impact or interfere in running of client services (temporary closure or effecting move etc to any dept).

Spare intake provision on LV/HV switchboard for connection of external power supply mobile unit or a permanent independent lockable unit linked to LV/HV switchboard. Provision should be made for mobile unit parking, earth rod and or earth mat.

Emergency gensets back up supply designed in accordance with Schedule 6 requirements.

Emergency power supply distribution - provision for auto load discrimination status for non-critical loads. Where possibility of non-essential load exists, non emergency loads to have automatic reset facility via BMS in lieu of local manual reset.

Where load bank arrangement may not be possible due to space constraints then provide a permanent fixed cable with necessary "plug-in" socket to a mobile load bank. Provision should be made for parking of the mobile ballast load.

Housing;

It is preferred that emergency generators are housed separately in sound proofed accommodation. Where generators are housed with other plant due to space constraints then sound attenuation should be provided to reduce noise levels in accordance with client requirements and British Standards.

Oil Storage;

Avoid underground storage tank. If this is not possible then consideration must be given to the life of the tank (double skins with leak detection should be the minimum requirement) and ensure that it will last beyond the life of the building. Fuel transfer pump both powered and manual override should be installed and accessible.

Access to oil storage for delivery to be carefully plan and safe for any oil tanker. Preferably away from main building entrance.

Storage to be safely protected from thieves and vandalism, access restricted and should be under CCTV coverage.

4.6.17. Internal lighting

Whilst recognising architectural aesthetic of lighting design (architectural lighting should be done with LED technology in order to minimise the energy impact, maintenance and life

cycle), we would ask that the number of types of fittings be kept to a minimum to assist in the keeping of spare parts. The fittings should be easily available from recognised approved electrical wholesalers.

All light fittings are installed in positions that afford safe, effective access without the need to hire specialist access equipment. Where this is not feasible, a safe system of work will be demonstrated for the maintenance and cleaning of light fittings with access routes and safety systems incorporated within the design proposal

All lighting controls with fittings should be accessible by drop down gear trays. Diffusers must be hinged to enable easy cleaning

Energy efficiency lighting should be standard throughout. (high frequency, electronic ballast, Led technology, reflective surfaces.

Preference for lighting to be controlled by open protocol system via the BMS system or it specific software) located in the FM offices or client offices.

Corridors, circulation, consultant rooms and all cupboards offices and day care clinics to be controlled by PIR and occupancy sensors.

Lighting fitting should be specified in such a way that a single failure of it's component will not render in total light failure.

All fittings should be suitably marked identifying the distribution board and circuit from which they are fed, the reference should the same as the as electrical as built drawings.

Design consideration for specific areas;

Public areas;

Eliminate surface luminaires from public areas. Where they are used (i.e. plant room, staff areas, etc), avoid fittings with lamps exposed for health and safety reason.

Avoid fittings that act as dust traps, e.g. uplighters.

Wet rooms or any other high level of humidity rooms;

Avoid moisture resistant fittings in bathroom areas that have screw fixed coverings and is therefore time- consuming to replace lamps.

Plant rooms;

All light fittings to be blast resistant, ceiling and wall mounted fittings are acceptable, light level to be carefully plan in order to ensure proper task lighting above each plant equipment.

4.6.18. External lighting

Without compromising the security, light levels should be used to control external lighting using the BMS and external light level detectors to minimise the energy consumption. Careful coordination is to be done with the CCTV and intrusion/detection systems in order to avoid any dark areas and/or to control the external lighting.

Preference is given to high level external lights for the public areas (please ensure when this is the case, that we still can maintain the light fittings, i.e. hard standing around to be able to use cherry picker to access).

In external areas like gardens, courtyards (non 24/7 public access) should be on timer and movement sensors.

All low level external lighting (if required) should employ standard low energy/ high life expectancy lamps and be vandal-proof.

Ensure that all external walkways to access offices, buildings, external plant and equipment are suitably lit to allow all staff to have 24/7 access, light level sensors and movement sensors should be use to minimise energy consumption.

4.6.19. Emergency lighting

Avoid self contained (battery) emergency lighting for escape route. Central back up for emergency lighting is preferred with self testing and monitoring software and alarm to the BMS in case of failure (located in FM offices).

Where centralised emergency lighting is not possible (outside areas like remote compounds, external car parks lights, etc), the facilities require to be provided through the use of a secure key switch. Each emergency luminaire must be suitably marked with it's circuit number, its emergency status and its test switch number.

All test keys to be engraved to identify the switch, the key number and the external lighting zone number

4.6.20. Electrical Mechanical Interface

Electrical panels for mechanical plant should be located as near as possible to the plant it controls. BMS Controls panels should be individual to each plant and located within the plant. This will assist in retro fitting or plant replacement in future.

4.6.21. Fire Alarm Installations

Fire alarm will be open protocol and addressable.

Consider the implication of each area when designing detectors (smoke, heat, dust, etc).

Detector base should be universal as far as practicable

Install system to include software with capability of self check/test and /or from remote with print out.

Provision for testing of automatic fire dampers where installed in critical areas

Provision for testing of smoke control dampers

Audio level of fire alarm in sensitive areas should be adjustable and supplemented with visual (beacon), including in plant rooms where noise level can be high.

All systems have to be tested regularly in zones to suit clinical requirements this must be designed into the system.

Alarm panels should be situated in an area that can be accessed 24 hours a day, 7 days a week, if in areas accessible public, the fire alarm panel should have a clear key panel in front to avoid the public to temper with it..

Provide fire alarm telephone link – autodial system

Preference multi criteria heads only in critical areas

4.6.22. Grounding & Earthing

Design life of grounding bars should be beyond the life of the building.

4.6.23. Lightning Protections

Positions of earth tapes for inspections and test points should be accessible at all times.

Provision of easy access and labelled earth pits for testing

4.6.24. ICT

Dual emergency supply for IT rooms from separate sub stations

Raised floor should be considered for main IT room and PABX room as this is considered to be a most effective means of removing heat generated by equipment.

Ensure that the Lothian Board IT network is isolated from third party IT network such as FM providers. Dedicate hubs should be provided instead of installing firewall.

Provide leak detection system linked to BMS

All cooling should be N+1.

4.7 Specialist Installations

4.7.1. CCTV

The CCTV specifications will address the issue of privacy with neighbours' houses and public roads. It will specify the limitation for turning and tilting angles for all external cameras.

Externally cameras should be sighted over all main entrances and exits (including fire exits) and car parks plus routes to external public spaces.

External cameras should be located in environmental housing (fully waterproof) and include wiper/wash. They should be high resolution and with very high sensibility in order to be able to record details in the dark.

Internally as a minimum, cameras should cover all entrance lobbies/ halls/mall, reception and waiting areas, all lift lobbies/ stairwells each floor internal entrances to sensitive areas.

All cameras should be zoom, pan and tilt of heavy duty type; all should be high resolution colour with digital enhancing to allow tracking of suspects through the site and provide high definition identification pictures for use by the police and press.

Spherical enclosure (domed) for CCTV cameras centrally located at high level for main entrance. An uninterruptible power supply fitted to all CCTV equipment.

4.7.2. Building Management System (BMS)

When selecting the BMS, maintainability is a key consideration. A maintenance contract and ongoing software should therefore be incorporated into the equipment procurement process.

The BMS software should be compliant with BS EN 16001:2009, the software will be OPEN PROTOCOL.

Controls should also be simple, easy to understand and easy to operate.

- Provisions for 2 control stations, 1 in FM office and the workshop. – allow for 1 additional station within the client location as the client may require to see the BMS system (on a limited access).
- Remote laptop dial up facilities should be installed to monitor and alter of plant functions/parameters with built-in security levels
- Provision to interrogate/operate from plant room sub station
- Space temperature monitoring/control for shared areas for e.g. one monitor per few rooms (same type of use and exposition), each change of exposition or type of use should include a new room sensor. Waiting areas/Staff bases should have their own sensor.
- BMS monitoring, controlling heating/cooling all primary circuits, operation failure mode of all systems as agreed with Bouygues E&S
- BMS monitoring of water temperature required in storage water tanks (for each water tanks)
- All utility meters and sub meters to be linked to EMS system. The location of the sub meter locations will be confirmed with Bouygues E&S to ensure sufficient are provided to enable detailed energy consumption information to be gathered from significant consumer departments. Consumption information must be electronically transmitted to the energy monitoring computer system.
- The BMS and controls should have power failure back up enabling the controls to continue to operate during power failure for at least four hours with necessary override (manual) facility.

4.7.3. Energy Management System (EMS)

The system should be capable of supporting all obligations (Thermal and Energy Efficiency) of the PA, for monitoring energy used. Collection of data will be done every 15 minutes.

Most BMS manufacturers will claim that have a capability to perform EMS functions. However, experience shows that this is not quite the case. A dedicated EMS system is required. It can be interface with but not be the same as the BMS.

The EMS software should be OPEN PROTOCOL and will have power back up failure.

4.7.4. Medical Engineering and Equipment

Compressed air plant and vacuum plant should be of a duplicate unit and should provide 100% redundancy.

Avoiding expansion joint on medical gas pipe work, where possible.

Liquid oxygen ring main supply from twin VIE vessels to be located preferably diametrically opposite. This will enhance redundancy and stand by capacity for oxygen supply.

Medical gases alarm sensors should be located within zone isolation box. Avoid locating these sensors in ceiling, as they will be difficult to repair and calibrate.

Provision of extract fans or WAGGS where N2O2 installed in labour rooms

Med Air and Vacuum system provision for four compressor units and twin press V/L and twin filtration and dryer units for purposes of additional redundancy and plant longevity

Provision of oily water separators to all med air and general compressor units

Oxygen pipe work sizing for ring main and in individual bocks containing critical care to enable adequate volume flow for CPAP + normal usage simultaneously

Consider independent gas scavenging for each theatre rather than common plant for all to ensure a balanced system for individual theatres

Water installations of any kind should not be placed above sensitive medical equipment such as scanners, x-ray equipment, sun lamps and cardiology rooms with moveable equipment. This is to avoid leakage onto the equipment and includes placing on the floor above. Any water services near these locations should have drip trays underneath with leakage detection and no joints in the vicinity.

No push fit joints should be used at all, above sensitive medical equipment

4.7.5. Endoscopy rooms (if present)

All endoscopies areas should be treated as wet rooms, including for lighting and wall protections.

Sufficient space should be provided to have storage of endoscopes trolleys within the endoscopy cleaning rooms.

Preference for pass through endoscope cleaning equipment.

All water supplies for endoscope cleaners are to be from specific salt plus RO plant with N+1. Location of the water plant equipment should be within 20m from the equipment served (due to plumbing issues – allow for pvc piping as an option).

D&B should pay particular attention to the water supply pressure and temperature of the water supply and RO plant room temperature.

4.8 External

4.8.1. Entrances

All external hard areas at entrances are required to be of construction appropriate for expected pedestrian traffic. An external water and power supply to be included to allow jet wash cleaning at regular intervals

Water features as part of the decor should be avoided due to maintenance (water treatment, cleaning) and other hazards (Legionella, birds etc) – It is not in the RHSC & DCN scheme but if required by the client, D&B should design ponds (no water feature requiring power) that are self sufficient and maintenance free (allow for a water supply to be in vicinity for refilling during dry period and high level drain to avoid spillage on the ground around in case of heavy rain).

4.8.2. Anti Graffiti

Use anti graffiti paint in areas where public is received and generally where all public can access. Anti graffiti should be up to 2.5m high above human accessible level.

4.8.3. Drainage

Locate manholes in discreet areas but with easy access for purpose built vehicles for maintenance (jetting, survey, etc). Water outlet should be in the vicinity for this purpose. Avoid manholes in car park place (pathways and road are acceptable as long as public can use an alternative route).

Gully drainage is preferred than underground drainpipe.

All external foul drains should be fitted with rodding points

External drainage drop pipes should be provided with caps to prevent vermin access

Where external drainage drop pipes are provided in an enclosure, provision for safe maintenance access will be provided

Drainage around (oil tanker parking for loading) and in the oil storage (if it is an external compound) will be link to an oil interceptor (link to BMS)

4.8.4. Roads, Street Furniture

Robust and low maintenance furniture is encouraged. Avoid permanently fixed furniture (welded in is not permitted) specific ground screw or bolt should be used to fix them, it may need relocated in the future.

General waste bins should be of a fixed/tilt design and /or internal lining easily removable to allow emptying and cleaning (D&B will provide at least 5 keys/special tools to Bouygues E&S at hand over.

Reserved car parking spaces (other than in the car parks) should be marked in chevrons and appropriate notices, preference for physical segregation between public and non public car parks, like automated barriers and/or bollards.

4.8.5. Landscape

This is the responsibility of Lothian Board but we should consider;

Gritting salt bins locations as part of landscape design (in secured bins, with keys). In parts of the country where severe winter is common, salt storage for snow/ice clearing vehicle is an essential part of the design.

All borders should be provided with low maintenance plants which give good ground cover and colour throughout the year, hardy and slow growing plants are preferred. All borders containing the plant should higher level than the ground in order to avoid ground and mulch to fall on the road or footpath as soon as it rain.

All boundaries should be constructed of robust material requiring little attention, careful consideration when using landscaping for segregation of areas (like public footpaths to car parks) as a temporary physical barrier will have to be put in place until the landscaping has grown enough.

4.8.6. Auxiliary Buildings (if present)

External buildings should be considered for, flammable store, clinical waste storage, medical gas storage etc.

These buildings should be secured, well lit, ventilated and heated.

4.8.7. Lightwells/Courtyards

Lightwells and courtyards should have access wide enough to enable cherry pickers and/or scissors lifts or other equipment to enter. Access should also be via a corridor and not through a particular department or individual's office

It is necessary to agree at an early stage the proposed use for each courtyard as to whether staff or members of the public will have access or whether it will be a purely decorative feature with access for maintenance only. This will affect the maintainability of the space and could have implications for fire regulation compliance

4.8.8. Car Park (if present)

The car park area design should incorporate the following elements:

- Provision of a safe and convenient vehicle and entry/exit that avoids traffic/pedestrian conflict and impact on the surrounding road.
- The movement of pedestrians throughout the car park should be clearly delineated by all users of the car park and minimises conflict with vehicles.
- Provision for disabled spaces, elderly and family should be suitably located near entrances to the building and lifts/access ramps i.e. design for access and mobility in accordance with regulations.
- Provide adequate CCTV coverage (see 9.1 CCTV)
- Lighting and CCTV cameras to be located for easy access for maintenance/repair during working hours (e.g. centre of bays).
- Allow for RJ45 sockets and mounting brackets for mobile cameras to cover blind spots should the need arise for additional monitoring requirement in future.
- Drainage channel provided will be of sufficient size for inspection and cleaning purposes.
- Structural expansion joints will be of a fuel/lube oil resistant material and will be located for easy access for renewal purposes.
- Engineering services installations (lighting, distribution boards etc) will be located to facilitate cyclical renewal/replacement with minimum disruption to provision of car park services.
- Engineering design should allow for adequate zoning, controls and isolation capabilities for engineering services (fire detection, lighting, electrics etc) for inspection/testing, maintenance/repair purposes to be undertaken during working hours with the remaining system in operation.
- Provide crash barriers around light or CCTV columns. Ensure columns are well lit and painted with luminous/reflective paint.
- Lighting strategy should allow for multiple lights per unit (type low energy, high luminescence) to enable minimum level to prevent Estate staff call-outs during out of working hours.
- Provide for storage and easy access to gritting bins, fuel spill kits that are of a lockable and immovable type.
- Lighting in car parks should be where possible the drop down type to provide ease of maintenance, where not practical sufficient access will be available around lighting poles for access by cherry picker
- Ensure that any electrical distribution panels are located in a accessible area with sufficient space in front to carry maintenance away from road traffic.

IHS LOTHIAN INTEGRATED HEALTH SOLUTIONS

FM PARTNER

BOUYGUES ENERGIES & SERVICES

5 Specific Specifications Requirements for the RHSC & DCN

Bouygues E&S comments on specific D&B specification for the new RHSC & DCN project are attached in Appendix 2

6 Appendices

6.1 Appendix 1 – HFM SoA Requirements for the RHSC & DCN

No.	For the New RHSC &DCN Hospital we will require :	BYes FM Brief	Ref Scheme Prov.	Combined Brief	Location	As Drawn	Room Code
1	Contract Manager Office	6.0	~~15.0~~	6.0	basement	8.0	B-S6-009
2	Helpdesk	6.0	-	6.0	basement/ combined with Mgt Team	31.0	B-S6-005
3	BMS Station	6.0	~~10.0~~	6.0	basement	8.0	B-S6-003
4	Mgt Team x 5 plus hot desk Needs small sink & hot water boiler in corner)	25.0	-	25.0	basement/ combined with Helpdesk	-	B-S6-005
5	Supervisors x 3	15.0	-	15.0	basement	15.0	B-S6-011
6	Estates library (photocopying)	6.0	-	6.0	basement	8.0	B-S6-010
7							
8	Workshop	60.0	~~45.0~~	60.0	basement	58.9	B-S6-004
9	Store	25.0	~~30.0~~	25.0	basement	24.4	B-S6-002
10	Chemical Store	5.0	-	5.0	basement	5.0	B-S6-015
11	25 Lockers/ changing rooms/ toilets	-	15.0	15.0	basement	21.8	B-S6-006
12	shower	-	2.5	2.5	basement	2.5	B-S6-007
13	shower	-	2.5	2.5	basement	2.5	B-S6-008
14	Cherry Picker store in Atrium	-	-		atrium/ ground floor		
15	Staff WC	-	3.0	3.0	basement	3.0	B-S6-010
16	Workshop (NHSL)	-	30.0	30.0	basement	31.0	B-S6-009
		154.0	**153.0**	**207.0**		**219.1**	
	First 6 spaces to be co-located (AA email 15 May 13)						

6.2 Appendix 2 – Bouygues E&S Comments/Requirements on D&B Specifications

Please see attached file.

6.3 Appendix 3 – Bouygues E&S Recommended Suppliers Standards (Warranty & Maintenance)

Please see attached file.

SCHEDULE PART 6

FM's Requirements

[Refer to Excel Spreadsheet]

ACCEPTABLE DESIGN LIFE PROPOSALS

The parties shall use all best endeavours to agree a reasonable alternative products or manufacturers should the requirements contained in the following table cannot be met

IHS LOTHIAN

RHSC and DCN

Schedule of Life Expectancies and FM Requirements

			The Board				IHS Lothian				
Ref	ASSET DESCRIPTION		Board Required Life Expectancies	Bouygues ES Required Life Expectancies	Bouygues ES Required Warranties	Brookfield Multiplex Proposal	Bouygues ES Required Resilience	Bouygues ES FM Req & Maint Contract	BMCE Comments & proposed specifications	IHS Lothian (agreed FM uplift)	Proposals accepted and agreed by all Parties
	Element	Sub Element	(In accordance with para 5.1 of BCRs)	Yrs	Yrs		(see Desig Guide for full details)	(see FM Desig Guide and Comments on Specs for full details)			Y/N (+ date)
a)	Structure, including substructure		70 years	see expanded elemental schedule	see expanded elemental schedule	70 years	see expanded elemental schedule	see expanded elemental schedule		70 years	
b)	Floor Structure		70 years	see expanded elemental schedule	see expanded elemental schedule	70 years	see expanded elemental schedule	see expanded elemental schedule		70 years	
c)	Roof Structure		70 years	see expanded elemental schedule	see expanded elemental schedule	70 years	see expanded elemental schedule	see expanded elemental schedule		70 years	
d)	Drainage and below ground civil engineering infrastructure		70 years	see expanded elemental schedule	see expanded elemental schedule	70 years	see expanded elemental schedule	see expanded elemental schedule		70 years	
e)	External Walls		70 years	see expanded elemental schedule	see expanded elemental schedule	70 years	see expanded elemental schedule	see expanded elemental schedule		70 years	
f)	External Openings, windows and door		25 years	see expanded elemental schedule	see expanded elemental schedule	25 years	see expanded elemental schedule	see expanded elemental schedule		25 years (TBA)	
g)	Roof Finishes		25 years	see expanded elemental schedule	see expanded elemental schedule	25 years	see expanded elemental schedule	see expanded elemental schedule		25 years (TBA)	
h)	External finishes		25 years	see expanded elemental schedule	see expanded elemental schedule	25 years	see expanded elemental schedule	see expanded elemental schedule		25 years (TBA)	
i)	External Hard Surfaces		20 years	see expanded elemental schedule	see expanded elemental schedule	20 years	see expanded elemental schedule	see expanded elemental schedule		20 years (TBA)	
j)	Internal partitions including openings		25 years	see expanded elemental schedule	see expanded elemental schedule	25 years	see expanded elemental schedule	see expanded elemental schedule		25 years (TBA)	
k)	Internal Doors		25 years	see expanded elemental schedule	see expanded elemental schedule	25 years	see expanded elemental schedule	see expanded elemental schedule		25 years (TBA)	
l)	Internal finishes (excluding soft flooring and painted finishes)		15 years	see expanded elemental schedule	see expanded elemental schedule	15 years	see expanded elemental schedule	see expanded elemental schedule		15 years (TBA)	
m)	Soft flooring		12 years	see expanded elemental schedule	see expanded elemental schedule	12 years	see expanded elemental schedule	see expanded elemental schedule		12 years (TBA)	
n)	Internal fixtures and fittings		15 years	see expanded elemental schedule	see expanded elemental schedule	15 years	see expanded elemental schedule	see expanded elemental schedule		15 years (TBA)	
o)	Engineering plant		CIBSIE Guidance	see expanded elemental schedule	see expanded elemental schedule	CIBSIE Guidance	see expanded elemental schedule	see expanded elemental schedule		CIBSIE Guidance	
p)	Engineering services distribution systems		CIBSIE Guidance	see expanded elemental schedule	see expanded elemental schedule	CIBSIE Guidance	see expanded elemental schedule	see expanded elemental schedule		CIBSIE Guidance	

Notes

1. It is intended that this form is expanded to reflect the various elements of Construction Works.
   This is the proposed requirements from FM perspectives
2. It is a moving document to reflect design development and concession made between D&B and FM
   Parties to indentify solutions that meets both NHS and FM requirements. Agreement to be recorded in the last 2 columns for post FC stage

IHS LOTHIAN

RHSC and DCN

Schedule of Life Expectancies and FM Requirements

			The Board				IHS Lothian				
Ref	ASSET DESCRIPTION		Board Required Life Expectancies	Board Construction Requirements	Board Testing Requirements	Bouygues ES Required Life Expectancies	Bouygues ES Required Warranties	Bouygues ES Required Resilience	Bouygues ES FM Req & Maint Contract	BMCE Comments & proposed specifications	Proposals accepted and agreed by all Parties
	Element	Sub Element	(In accordance with para 5.1 of BCRs)	(see Part 6 - BCRs)	(see Part 6 - BCRs)	Yrs	Yrs	(see Desig Guide for full details)	(see FM Desig Guide and Comments on Specs for full details)		Y/N (+ date)
1	SUBSTRUCTURE										
1.1	Foundations	Standard foundations	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
		Pile foundations	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
		Underpinning	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
1.2	Basement Excavation	Basement excavation	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
1.3	Basement Retaining Walls	Basement retaining walls	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
		Embedded basement retaining walls	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
1.4	Ground Floor Construction	Ground floor slab / bed and suspended floor construction	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
2	SUPERSTRUCTURE										
2.1	Frame	Steel frames	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
		Space decks	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
		Concrete casings to steel frames	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
		Concrete frames	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
		Timber frames	N/A			N/A	N/A	N/A	N/A		
		Specialist frames (Helipad)	N/A			40+	N/A	N/A	N/A		
2.2	Upper floors	Concrete floors	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
		Precast/composite decking systems	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
		Timber floors	N/A			N/A	N/A	N/A	N/A		
		Structural screeds	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
		Balconies	N/A			40+	N/A	N/A	N/A		
		Drainage to balconies	70	see BCRs part 6 Section 3		40+	N/A	N/A	N/A		
2.3	Roof	Roof structure	70	see BCRs part 6 Section 3		40+	N/A	N/A	See FM Guide & Spec Comments		
		Roof covering	25	see BCRs part 6 Section 3		25+	25+	N/A	See FM Guide & Spec Comments		

			The Board				IHS Lothian			
Ref	ASSET DESCRIPTION		Board Required Life Expectancies	Board Construction Requirements	Board Testing Requirements	Bouygues ES Required Life Expectancies	Bouygues ES Required Warranties	Bouygues ES Required Resilience	Bouygues ES FM Req & Maint Contract	BMCE Comments & proposed specifications	Proposals accepted and agreed by all Parties
	Element	Sub Element	(In accordance with para 5.1 of BCRs)	(see Part 6 - BCRs)	(see Part 6 - BCRs)	Yrs	Yrs	(see Desig Guide for full details)	(see FM Desig Guide and Comments on Specs for full details)		Y/N (+ date)
		Glazed roofs	25	see BCRs part 6 Section 3		25+	25+	N/A	See FM Guide & Spec Comments		
		Roof drainage	25	see BCRs part 6 Section 3		25+	N/A	N/A	See FM Guide & Spec Comments		
		Rooflights, skylights and openings	25	see BCRs part 6 Section 3		25+	10+	N/A	See FM Guide & Spec Comments		
		Roof features (Helipad)	25	see BCRs part 6 Section 3		25+	N/A	N/A	See FM Guide & Spec Comments		
		Green Roof	25	see BCRs part 6 Section 3		25+	25+	N/A	See FM Guide & Spec Comments		
		Zinc roofing	25	see BCRs part 6 Section 3		25+	25+	N/A	See FM Guide & Spec Comments		
		Automatic Smoke vent	25	see BCRs part 6 Section 3		25+	25+	N/A	See FM Guide & Spec Comments		
		Aluminium Helideck (25m x 25m excluding netting dimensions) and Anti-Slip Construction - by Bayards	25	see BCRs part 6 Section 3		25+	20+	N/A	See FM Guide & Spec Comments		
2.4	Stairs	Stair/ramp structures	70	see BCRs part 6 Section 3		40+	N/A	N/A	See FM Guide & Spec Comments		
		Stair/ramp finishes	15	see BCRs part 6 Section 3		15+	N/A	N/A	See FM Guide & Spec Comments		
		Stair/ramp balustrades and handrails	25	see BCRs part 6 Section 3		25+	N/A	N/A	See FM Guide & Spec Comments		
		Ladders/chutes/slides	25	see BCRs part 6 Section 3		25+	N/A	N/A	See FM Guide & Spec Comments		
2.5	External Walls	External walls above ground floor level	70	see BCRs part 6 Section 3		40+	N/A	N/A	See FM Guide & Spec Comments		
		External walls below ground level	70	see BCRs part 6 Section 3		40+	N/A	N/A	See FM Guide & Spec Comments		

			The Board				IHS Lothian			
Ref ASSET DESCRIPTION		Board Required Life Expectancies	Board Construction Requirements	Board Testing Requirements	Bouygues ES Required Life Expectancies	Bouygues ES Required Warranties	Bouygues ES Required Resilience	Bouygues ES FM Req & Maint Contract	BMCE Comments & proposed specifications	Proposals accepted and agreed by all Parties
Element	Sub Element	(In accordance with para 5.1 of BCRs)	(see Part 6 - BCRs)	(see Part 6 - BCRs)	Yrs	Yrs	(see Desig Guide for full details)	(see FM Desig Guide and Comments on Specs for full details)		Y/N (+ date)
	Solar/rainscreen cladding	25	see BCRs part 6 Section 3		25+	20+	N/A	See FM Guide & Spec Comments		
	External soffits	25	see BCRs part 6 Section 3		25+	20+	N/A	See FM Guide & Spec Comments		
	Subsidiary walls, balustrades, handrails, railings and proprietary balconies	70	see BCRs part 6 Section 3		40+	N/A	N/A	See FM Guide & Spec Comments		
	Facade access/cleaning systems	25	see BCRs part 6 Section 3		25+	N/A	N/A	See FM Guide & Spec Comments		
	Atrium Glazing at Entrances	25	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Schuco (or similar) aluminium curtain walling	25	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Double glazed automatic door	25	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Main Building	25	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Schuco (or similar) aluminium curtain walling	25	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Ditto curved	25	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Alternative 1 Pilkington Profilit glazing system or similar	25	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Single glazed door	25	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Precast concrete panels - exposed aggregate finish		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Alternative - Precast concrete panels - brick clad panels		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		

			The Board				IHS Lothian			
Ref ASSET DESCRIPTION		Board Required Life Expectancies	Board Construction Requirements	Board Testing Requirements	Bouygues ES Required Life Expectancies	Bouygues ES Required Warranties	Bouygues ES Required Resilience	Bouygues ES FM Req & Maint Contract	BMCE Comments & proposed specifications	Proposals accepted and agreed by all Parties
Element	Sub Element	(In accordance with para 5.1 of BCRs)	(see Part 6 - BCRs)	(see Part 6 - BCRs)	Yrs	Yrs	(see Desig Guide for full details)	(see FM Desig Guide and Comments on Specs for full details)		Y/N (+ date)
	Sto Render System		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Zinc standing seam	25	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Copper cladding, (allow rainscreen)		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Louvre system to plant areas; PPC finish		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Courtyards		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Sto Render System		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Energy centre		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Sto Render System		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Steel framing system:		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Sundries		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Fire barriers to external cavity		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	rain screen cladding		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Entrance features, carved stone signs, logos etc		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Below ground		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		

			The Board				IHS Lothian			
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		Solar shading		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		External Soffits		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Balustrades / railings		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
2.6	Windows and External Doors	External windows	25	see BCRs part 6 Section 3	Project Co shall test the windows and other external opening assemblies (louvres and doors)	20+	15+	N/A	See FM Guide & Spec Comments		
		External doors	25	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Velfac 200 (or similar) aluminium clad timber window system with sealed double glazed units incorporating tempered safety glass below 800mm, aluminium colour to be RAL 1035 Pearl finish, timber to be clear finish	25+	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Metal door, double, PPC finish	N/A	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Shutter to service yard	N/A	see BCRs part 6 Section 3		10+	10+	N/A	See FM Guide & Spec Comments		
2.7	Internal Walls and Partitions	Walls and partitions	25	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Balustrades and handrails	25	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Moveable room dividers	N/A	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Cubicles	N/A	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		

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		Linings		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		High Quality walls		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Atrium Walls		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Pod Walls		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Sundries		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Glazed Balustrade		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Panel Cubicles		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Fire shutters (7m long)		see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Block inner skin to retention system including cavity drain system and lying to concrete retaining wall	35	see BCRs part 6 Section 3		30+		N/A	See FM Guide & Spec Comments		
		Wall protection	Board	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
2 8	Internal Doors	Internal doors	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Unrated; single leaf doors	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Unrated; leaf & a half doors	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Unrated; double doors	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		

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		Unrated; double corridor (double swing) doors	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Unrated; ensuite pod doors	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Unrated; folding door, 1.5m wide	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Unrated; folding door, 3.75m wide	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Unrated; pressurised lobby double door	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		30FR; single leaf doors	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		30FR; leaf & a half doors	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Door ironmongery	16	see BCRs part 6 Section 3		15+	10+	N/A	See FM Guide & Spec Comments		
3	INTERNAL FINISHES										
3.1	Wall Finishes	Finishes to walls	Board	see BCRs part 6 Section 3							
		Paint	Board	see BCRs part 6 Section 3		7+	5+	N/A	See FM Guide & Spec Comments		
		Rigid sheet fine linings / panelling	Board	see BCRs part 6 Section 3		12+	N/A	N/A	See FM Guide & Spec Comments		
		IPS Panels	N/A	see BCRs part 6 Section 3		20+	N/A	N/A	See FM Guide & Spec Comments		
		Wallpaper	Board	see BCRs part 6 Section 3		12+	N/A	N/A	See FM Guide & Spec Comments		
3.2	Floor Finishes	Finishes to floors	15	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		

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	Raised access floors	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
	DPM	25	see BCRs part 6 Section 3		30+	10+	N/A	See FM Guide & Spec Comments		
	DPM, 2 coats applied to concrete	25	see BCRs part 6 Section 3		30+	10+	N/A	See FM Guide & Spec Comments		
	Screed	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
	Thin coat screed 15mm - 80% of area	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
	50mm screed - 20% of area	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
	Marmoleum	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
	Linoleum, Forbo Marmoleum	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
	Extra; coved skirting formed from marmoleum	25	see BCRs part 6 Section 3			10+	N/A	See FM Guide & Spec Comments		
	Safety vinyl	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
	Forbo safestep	25	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
	Carpet floor finish	7	see BCRs part 6 Section 3		10+	10+	N/A	See FM Guide & Spec Comments		
	Matwells		see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
	Paint		see BCRs part 6 Section 3		10+	10+	N/A	See FM Guide & Spec Comments		

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		Paint to Plant Rooms		see BCRs part 6 Section 3		10+	10+	N/A	See FM Guide & Spec Comments		
		White lining to Service Yard/Loading bay		see BCRs part 6 Section 3		7+	5+	N/A	See FM Guide & Spec Comments		
		Mall Finish to The Pod & Main Entrance		see BCRs part 6 Section 3		7+	5+	N/A	See FM Guide & Spec Comments		
3.3	Ceiling Finishes	Finishes to ceilings	22	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		False ceilings	22	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Demountable suspended ceilings	22	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
						20+	10+	N/A	See FM Guide & Spec Comments		
		Plasterboard Suspended Ceilings		see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Rigid sheet fine linings / panelling		see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Metal Shielding		see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
		Paint		see BCRs part 6 Section 3		10+	5+	N/A	See FM Guide & Spec Comments		
		Cavity barriers		see BCRs part 6 Section 3		30+	10+	N/A	See FM Guide & Spec Comments		
		Thermal and acoustic insulation		see BCRs part 6 Section 3		30+	10+	N/A	See FM Guide & Spec Comments		
4	FITTINGS, FURNISHINGS & EQUIPMENT										
4.1	General Fittings, Furnishings	General fittings, furnishings and equipment	8 -10	see BCRs part 6 Section 3		15+	10+	N/A	See FM Guide		

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	and Equipment								& Spec Comments		
		Domestic kitchen fittings and equipment	12	see BCRs part 6 Section 3		15+	10+	N/A	See FM Guide & Spec Comments		
		Signs/notices	12	see BCRs part 6 Section 3		15+	10+	N/A	See FM Guide & Spec Comments		
		Works of art	N/A	see BCRs part 6 Section 3		30+	10+	N/A	See FM Guide & Spec Comments		
		Equipment	10	see BCRs part 6 Section 3		15+	10+	N/A	See FM Guide & Spec Comments		
4.2	Special Fittings, Furnishings and Equipment	Special fittings, furnishings and equipment	N/A	see BCRs part 6 Section 3		12+	10+	N/A	See FM Guide & Spec Comments		
4.3	Internal Planting	Internal planting	N/A	see BCRs part 6 Section 3		12+	10+	N/A	See FM Guide & Spec Comments		
4.4	Bird and Vermin control	Bird and vermin control	N/A	see BCRs part 6 Section 3		20+	10+	N/A	See FM Guide & Spec Comments		
5	**SERVICES INSTALLATIONS**										
5.1	Sanitary Appliances	Sanitary appliances	CIBSE	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Pods	CIBSE	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Sanitary fillings	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
5.2	Services Equipment	Services equipment	CIBSE	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
5.3	Disposal Installation	Foul drainage above ground	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Laboratory and industrial liquid waste drainage	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		

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	Refuse disposal	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
5.4	Water Installation									
	Mains water supply	CIBSE	see BCRs part 6 Section 3		25+	15+	N+1	See FM Guide & Spec Comments		
	Cold water distribution	CIBSE	see BCRs part 6 Section 3		25+	15+	N+1	See FM Guide & Spec Comments		
	Hot water distribution	CIBSE	see BCRs part 6 Section 3		25+	15+	N+1	See FM Guide & Spec Comments		
	Local hot water distribution	CIBSE	see BCRs part 6 Section 3		25+	15+	N+1	See FM Guide & Spec Comments		
	Steam and condensate distribution	CIBSE	see BCRs part 6 Section 3		25+	15+	N+1	See FM Guide & Spec Comments		
5.5	Heat source									
	Heat source	CIBSE	see BCRs part 6 Section 3		25+	15+	N+1	See FM Guide & Spec Comments		
	Boiler units, dual gas and oil burners, 4MW	CIBSE	see BCRs part 6 Section 3		25+	20+	N+1	See FM Guide & Spec Comments		
	Flues within boiler room	CIBSE	see BCRs part 6 Section 3		25+	20+	N/A	See FM Guide & Spec Comments		
	Heat Source - CHP	CIBSE	see BCRs part 6 Section 3		25+	20+	N/A	See FM Guide & Spec Comments		
5.6	Space Heating and Air Conditioning									
	Central heating	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
	Local heating	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
	Central cooling	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
	Local cooling	CIBSE	see BCRs part 5 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		

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		Central heating and cooling	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
		Local heating and cooling	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
		Central air conditioning	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
		Local air conditioning	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
5.7	Ventilating System	Central ventilation	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
		Local and special ventilation	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
		Smoke extract/control	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
5.8	Electrical Installations	Electrical mains and submains distribution	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
		Power installations	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Lighting installations	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Specialist lighting installations	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
		Local electricity generation systems	CIBSE	see BCRs part 6 Section 3		20+	15+	1	See FM Guide & Spec Comments		
		Transformation devices	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
		Earthing and bonding systems	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		

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5.9	Gas and Other Fuel Installations	Gas distribution	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
		Fuel storage and pipe distribution systems	CIBSE	see BCRs part 6 Section 3		20+	15+	N+1	See FM Guide & Spec Comments		
5.1	Lift and Conveyor Installations	Lifts	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Enclosed hoists	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Escalators	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Moving pavements	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Powered stairlifts	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Conveyors	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Dock levellers and scissor lifts	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Cranes and unenclosed hoists	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Car lifts, car stacking systems, turntables and the like	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Document handling systems	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Other lift conveyor systems	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
5.11	Fire and Lightning Protection	Fire fighting equipment	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		

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		Lightning protection	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
5.12	Communications, Security and Control Systems	Communication systems	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Security systems	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Central control/building management systems	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
5.13	Specialist installations	Specialist piped supply systems	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Radio and television studios	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Specialist refrigeration systems	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Water features	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
		Other specialist installations	CIBSE	see BCRs part 6 Section 3		20+	15+	N/A	See FM Guide & Spec Comments		
6	**COMPLETE BUILDINGS**										
6.1	Prefabricated buildings		N/A	N/A							
7	**WORK TO EXISTING BUILDINGS**										
7.1	Minor Demolition works and alteration work		N/A	N/A							
8	**EXTERNAL WORKS**										
8.1	Site Preparation Works	Site clearance	N/A	see BCRs part 6 Section 3		N/A	N/A	N/A	N/A		
		Preparatory groundwork	N/A	see BCRs part 6 Section 3		N/A	N/A	N/A	N/A		
8.2	Roads, Paths and Pavings	Roads, paths and paving	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Specialist surfacing and paving	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide		

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									& Spec Comments		
8.3	Planting	Seeding and turfing	Board	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		External planting	Board	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
8.4	Fencing, Railings and Walls	Fencing and railings	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Walls and screens	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Retaining walls	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Barriers and guardrails	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
8.5	Site/Street furniture and Equipment	Site/street furniture and equipment	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Ornamental features	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
8.6	External Drainage	Surface water and foul water drainage	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Ancillary drainage systems	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		External laboratory and industrial liquid waste drainage	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Land drainage	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
		Testing and commissioning of external drainage installations	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
8.7	External Services	Water mains supply	20	see BCRs part 6 Section 3		25+	15+	2 supplies	See FM Guide		

			The Board				IHS Lothian			
Ref	ASSET DESCRIPTION	Board Required Life Expectancies	Board Construction Requirements	Board Testing Requirements	Bouygues ES Required Life Expectancies	Bouygues ES Required Warranties	Bouygues ES Required Resilience	Bouygues ES FM Req & Maint Contract	BMCE Comments & proposed specifications	Proposals accepted and agreed by all Parties
	Element / Sub Element	(In accordance with para 5.1 of BCRs)	(see Part 6 - BCRs)	(see Part 6 - BCRs)	Yrs	Yrs	(see Desig Guide for full details)	(see FM Desig Guide and Comments on Specs for full details)		Y/N (+ date)
								& Spec Comments		
	Electricity mains supply	20	see BCRs part 6 Section 3		25+	15+	2 supplies	See FM Guide & Spec Comments		
	External transformation devices	20	see BCRs part 6 Section 3		25+	15+	2 supplies	See FM Guide & Spec Comments		
	Electricity distribution to external plant and equipment	20	see BCRs part 6 Section 3		25+	15+	2 supplies	See FM Guide & Spec Comments		
	Gas mains supply	20	see BCRs part 6 Section 3		25+	15+	2 supplies	See FM Guide & Spec Comments		
	Telecommunicaions and other communication system connections	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Fuel storage and piped distribution systems	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	External security systems	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Site/street lighting systems	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Irrigation systems	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Local/district heating installations	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Builder's work in connection with external services	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Testing and commissioning of external services	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
8.8	Minor Building works and Ancillary Buildings Minor building work	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide & Spec Comments		
	Ancillary buildings and structures	20	see BCRs part 6 Section 3		25+	15+	N/A	See FM Guide		

			The Board					IHS Lothian			
Ref	ASSET DESCRIPTION		Board Required Life Expectancies	Board Construction Requirements	Board Testing Requirements	Bouygues ES Required Life Expectancies	Bouygues ES Required Warranties	Bouygues ES Required Resilience	Bouygues ES FM Req & Maint Contract	BMCE Comments & proposed specifications	Proposals accepted and agreed by all Parties
	Element	Sub Element	(in accordance with para 5.1 of BCRs)	(see Part 6 - BCRs)	(see Part 6 - BCRs)	Yrs	Yrs	(see Desig Guide for full details)	(see FM Desig Guide and Comments on Specs for full details)		Y/N (+ date)
									& Spec Comments		
		Underpinning to external site boundary walls	70	see BCRs part 6 Section 3		40+	N/A	N/A	See FM Guide & Spec Comments		

Notes

1. It is intended that this form is expanded to reflect the various elements of Construction Works. This is the proposed requirements from FM perspectives
2. It is a moving document to reflect design development and concession made between D&B and FM. Parties to indentify solutions that meets both B&B and FM requirements. Agreement to be recorded in the last 2 columns for post FC stage

THIS GUARANTEE is made the

BETWEEN:

(1) [**BOUYGUES ENERGIES & SERVICES S.A.S** (company number RCS Versailles 775 664 873) whose registered office is at 19 Rue Stephenson, 78180 Montigny-le-Bretonneux, France][**BROOKFIELD MULTIPLEX PTY Ltd**, whose registered office is at Level 22, 135 King Street, Sydney, Australia (the "**Guarantor**"); and

(2) [**BROOKFIELD MULTIPLEX CONSTRUCTION EUROPE LIMITED** (registered under number) whose registered office is [ ]] [**BOUYGUES ENERGIES & SERVICES FM UK LIMITED** (registered under number 04243192) whose registered office is at Waterloo Centre, Elizabeth House, 39 York Road, London SE1 7NQ] (the "**Beneficiary**")

WHEREAS:

A This Guarantee is supplemental to an interface contract, as amended or varied from time to time (the "**Interface Agreement**") made between IHS Lothian Limited, the Beneficiary and [●] a wholly-owned subsidiary of the Guarantor (the "**Subsidiary**"). Pursuant to the terms of the Interface Agreement, parties have agreed to procure the provision of a guarantee when required under the terms of the Interface Agreement.

IT IS HEREBY AGREED AS FOLLOWS:

1. In this Guarantee, words and expressions shall have the meanings as are assigned to them in the Interface Agreement unless otherwise stated. In addition the following expressions shall have the meanings now ascribed to them:

2. In consideration of entering into the Interface Agreement with the Beneficiary, the Guarantor irrevocably and unconditionally guarantees to the Beneficiary, both as guarantor and principal debtor:

   a. the due and punctual observation and performance by its Subsidiary of all duties, obligations, warranties and undertakings (whether actual, or contingent, present or future, express or implied) to be observed and performed on the part of the Subsidiary under or pursuant to the Interface Agreement when they become due and performable according to the terms of the Interface Agreement;

   b. the satisfaction of all claims, demands, losses, damages, liabilities, costs, fees, expenses and interest whatsoever arising in any way directly or indirectly out of any default by the Subsidiary of the Interface Agreement;

   c. the satisfaction of any judgment (including of interest) of any court, adjudicator or competent tribunal in respect of the Subsidiary's liability to the Beneficiary in respect of the performance of the Interface Agreement;

   d. that it will indemnify on demand against any loss or liability suffered by the Beneficiary if any obligation of the Subsidiary in the Interface Agreement is or becomes void, voidable or unenforceable or invalid (save where the Interface Agreement is void, voidable, unenforceable or invalid for reasons of illegality) but only to the extent that such Interface Agreement would not be unenforceable,

invalid or illegal against or in relation to any other person performing the obligations under the Interface Agreement in lieu of the Subsidiary.

provided always that:

i. the Guarantor's liability under this Guarantee will be limited to the liability of the Subsidiary under the Interface Agreement, or, in respect of liability under clause 2d, to the liability that the Subsidiary would have had under the Interface Agreement, had the obligations thereunder not been or become void, voidable, unenforceable or invalid; and

ii. the Guarantor shall be entitled to rely on any defences that the Subsidiary may have had under the Interface Agreement.

3. The Guarantor undertakes that, whenever the Subsidiary does not pay any amount when due under or in connection with the Interface Agreement, the Guarantor shall on demand pay that amount as the principal debtor within five (5) Business Days of the receipt by the Guarantor of a written notice in accordance with clause 17 below.

4. Subject to clause 3 above, the Guarantor agrees that the Beneficiary in the enforcement of its rights hereunder may proceed against the Guarantor as if it were a party to the Interface Agreement. The Guarantor hereby waives any right to require the Beneficiary to proceed against the Subsidiary or to pursue any other remedy whatsoever which may be available to the Beneficiary before proceeding against the Guarantor.

5. The obligations and liabilities of the Guarantor under this Guarantee shall be effective from the date hereof and shall not be affected, discharged or released in any way by any circumstances (except by a written discharge between the Guarantor and the Beneficiary) which would otherwise release the Guarantor from its obligations hereunder (and the Guarantor hereby waives any entitlement it may have to notice of any such circumstances), including:

a. any variation or amendment of the Interface Agreement (including without limitation extension of time) or any concession or waiver by the Beneficiary in respect of the Subsidiary's obligations;

b. the Interface Agreement or any provision of the Interface Agreement being or becoming illegal, invalid, void, voidable or unenforceable;

c. any forbearance or waiver of any right of action or remedy the Beneficiary may have against the Subsidiary or negligence by the Beneficiary in enforcing any such right of action or remedy;

d. any bond, undertaking, security or other guarantee held or obtained by the Beneficiary for all or any parts of the obligations whose performance is hereby guaranteed or any release or waiver thereof;

e. any legal limitation or incapacity relating to the Subsidiary; or

f. any other fact, circumstance, act, event, omission or provision of statute or law.

6. The Guarantor hereby further agrees with the Beneficiary that if the Subsidiary goes into liquidation and the liquidator shall disclaim the Interface Agreement, the liability of the Guarantor under this Guarantee shall remain in full force and effect in respect of any claims, demands, losses, damages, costs, fees, expenses and interest related to such liquidation or the termination of or under the Interface Agreement consequent thereon.

7. Without prejudice to clause 5, the Guarantor expressly confirms that it intends that this Guarantee shall extend from time to time to any (however fundamental) amendment, variation, increase, extension or addition of, under or to the Interface Agreement for any purpose and any fees, costs and/or expenses associated with such variation, increase, extension or addition.

8. The Guarantor must not (while the Subsidiary has any obligations or liabilities (actual or contingent) under the Interface Agreement), exercise any:

   a. rights of subrogation, contribution and indemnity;

   b. right to take the benefit of or enforce any security or other guarantee or indemnity for the Subsidiary's obligations held by the Beneficiary; and

   c. right to prove or claim in the bankruptcy, liquidation, administration or other insolvency proceedings of the Subsidiary,

   to the extent that in doing so would be in competition with, or contrary to the interests of, the Beneficiary. Any amount recovered as a result of the exercise of any such rights contrary to this clause shall be held on trust for the Beneficiary and shall be paid to the Beneficiary immediately upon receipt of such amount by the Guarantor. The Guarantor warrants to the Beneficiary that it has not taken any security from the Subsidiary in relation to this Guarantee and agrees not to do so. Any security taken by the Guarantor in breach of this provision and all moneys at any time received in respect thereof shall be held on trust for the Beneficiary.

9. All payments by the Guarantor under this Guarantee in respect of the Interface Agreement shall be made in full, without set-off or counterclaim and, subject to clause 10 of this Guarantee, free and clear of any deductions or withholdings in immediately available, freely transferable, cleared funds in Sterling for value on the date specified in the Beneficiary's demand to the account specified below: [●].

10. If at any time the Guarantor is required by law to make any deduction or withholding in respect of any taxes, duties or other charges or withholdings from any payment due hereunder, the sum due from the Guarantor in respect of such payment shall be increased to the extent necessary to ensure that, after the making of such deduction or withholding, the Beneficiary receives on the payment date and retains (free of any liability in respect of such deduction or withholding) a net sum equal to the sum which it would have received had no such deduction or withholding been required to be made.

11. No payment to the Beneficiary under this Guarantee in respect of the Interface Agreement or pursuant to any judgment or order of any court or otherwise shall operate to discharge the obligations of the Guarantor in respect of which it was made unless and until payment in full shall have been received in Sterling and, to the extent that the amount of any such payment shall on actual conversion into Sterling fall short of the amount of the obligation expressed in Sterling, the Beneficiary shall have a further and separate cause of action against the Guarantor for the recovery of such sum as shall after conversion into Sterling be equal to the amount of the shortfall.

12. This Guarantee is a continuing security and accordingly shall cover all of the obligations and liabilities of the Subsidiary to the Beneficiary under the Interface Agreement and shall remain in full force and effect until all the obligations of the Subsidiary shall have been paid, carried out, completed or discharged in full in accordance with the Interface Agreement save that if the Subsidiary satisfies the Net Tangible Asset threshold requirements set out in Clause 14 of the Interface Agreement this Guarantee shall cease to be in force and effect

13. For the benefit of the Beneficiary and the Subsidiary, the Guarantor waives any right or remedy that it has or may have to subrogation, indemnification or payment on any other basis by the Subsidiary and any other remedy against the Subsidiary (each a "Relevant Right") by reason of or in connection with the performance of the Guarantor's obligations under this Guarantee or the obligations under the Interface Agreement in circumstances where the Subsidiary promotes, enters into, or implements a voluntary arrangement (as defined in section 1(1) of the Insolvency Act 1986) or formal scheme of arrangement (under Part 26 of the Companies Act 2006), in each case as amended or re-enacted from time to time, or any analogous procedure in any jurisdiction. Damages shall not be an adequate remedy for the Beneficiary or the Subsidiary in respect of a breach of this clause and the parties shall consent to any application brought by the Beneficiary or the Subsidiary for an interdict to prevent any such Relevant Right being enforced.

14. If any moneys paid to the Beneficiary under the Interface Agreement by the Subsidiary have to be repaid to the Subsidiary by the Beneficiary by virtue of any provision or enactment relating to bankruptcy, insolvency or liquidation for the time being in force or on any other ground, the liability of the Guarantor under this Guarantee shall be computed as if such moneys had never been paid to the Beneficiary at all.

15. All notices and demands arising out of or in connection with this Guarantee shall be sent by personal delivery, post, airmail post or courier to the address set out below (as may be changed in accordance with Clause16):

    a. Upon the Beneficiary at [●] marked for the attention of [●];

    b. Upon the Guarantor at [●] marked for the attention of [●];

    provided that any notice or demand sent by personal delivery, post, airmail post or courier will be deemed (in the absence of earlier receipt) to have been delivered 10 day after dispatch.

16. The Beneficiary and the Guarantor may change their respective nominated addressees for service of documents to another addressee, but only with prior written notice to the other party giving not less than 7 days' notice in advance to the other parties. All demands and notices must be in writing.

17. This Guarantee is not assignable by the Beneficiary without the prior written agreement of the Guarantor other than (a) by way of security to the Security Trustee (as defined in the Project Agreement) on behalf of the Senior Funders (as defined in the Project Agreement), (b) to a person to whom the benefit of the Interface Agreement has been assigned or novated.

18. This Guarantee shall be governed by Scots law, and the Guarantor hereby irrevocably submits to the exclusive jurisdiction of the Court of Session in Edinburgh, save where the sheriff courts have exclusive competence in which case it shall be referred to the Sheriffdom of Lothian and Borders at Edinburgh (except for the purpose of enforcement proceedings in respect of any decision, judgment or award of such court in another jurisdiction) and irrevocably appoints the Subsidiary to accept service of any proceedings issued out of the Courts in Scotland as aforesaid.

19. The parties agree that this Guarantee shall not be amended without the prior written consent of the parties.

20. When used in this Guarantee, the expression "Working Days" means days (other than Saturdays or Sundays) on which banks are open for domestic business in the City of London.

21. The Beneficiary agrees to return this Guarantee to the Guarantor within 30 days of the expiry of all its rights under this Guarantee and the discharge of the liabilities of the Guarantor under this Guarantee. This Guarantee shall become automatically null and void at that time, whether or not this Guarantee has been returned to the Guarantor.

IN WITNESS WHEREOF these presents typewritten on this and the preceding 5 pages are executed by the parties hereto as follows:

SIGNED for and on behalf of **[BOUYGUES ENERGIES & SERVICES S.A.S] [BROOKFIELD MULTIPLEX PTY Ltd]**

at

on 2015 as follows:

..... Director

[redacted] ..... Full Name

Print Full Name

before this witness

_____ _____

Print Full Name

Address

_____

_____

SIGNED for and on behalf of **[and [BOUYGUES ENERGIES & SERVICES FM UK LIMITED] [BROOKFIELD MULTIPLEX CONSTRUCTION EUROPE LIMITED]**

at

on 2015 as follows:

..... Director

..... Full Name

Print Full Name

before this witness

_____ _____

Print Full Name

Address