



## Invitation to Tender (ITT)

Summer Project – Maintenance Works:  
Boiler and Heating Distribution  
at  
Lime Academy – Brookfield House  
Campus

### Document Control

<b>Title</b>	Summer Project – Maintenance Works at Lime Trust – Hornbeam Academy
<b>Created on</b>	15/05/21
<b>Created by</b>	RAM Building Consultancy / Lime Trust

### Document History

<b>Version</b>	<b>Date</b>	<b>Author</b>	<b>Detail</b>
1.0	13/03/2021	HC	Final

### Document Distribution

Open competition via MyTenders.

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## **1.0 INTRODUCTION AND GUIDANCE TENDER CONDITIONS**

### **1.1 Definitions**

The following definitions apply to this Invitation to Tender (ITT) and its supporting attachments:

- 1.1.1 Business Day is Monday to Friday excluding public holidays.
- 1.1.2 Bidder is any economic operator, regardless of their structure or organisation that submits or intends to submit a bid in response to this ITT.
- 1.1.3 Bidder Party is any third party that the Bidder includes in the process of preparing a bid in response to this ITT.
- 1.1.4 Bid Response Deadline is the date specified in the timetable for the delivery of a final response to this ITT.
- 1.1.5 Contracting Authority is the Lime Trust which is a charitable company limited by guarantee.
- 1.1.6 Lime Trust, herein known as the Trust is the Head Office responsible for the management of the sites within its Trust – Full details available on our website.
- 1.1.7 Procurement Lead is the member of staff at the Lime Trust to whom queries should be addressed and from whom all instructions relating to this ITT will be received.

### **1.2 Invitation to Tender/Scope**

- 1.2.1 This ITT is being issued as an open competition via My Tender.
- 1.2.2 The Trust wishes to engage a contractor to undertake the following maintenance works: roofing works (flat roofs, fascia, soffits, and guttering), external windows as required, and drainage works.
- 1.2.3 The project will be overseen by RAM Building Consultancy who will act as the Trust's Technical Advisor.
- 1.2.4 The requirement is fully detailed in tender documents.
- 1.2.5 The purpose of this ITT is to:
  - Elicit competitive tenders for evaluation;
  - Enable Bidders to demonstrate their experience and expertise and their suitability for our requirement and to provide a schedule of costs; and
  - Enable the Trust to select a provider offering the most economically advantageous tender.
- 1.2.6 The Contracting Authority is using an electronic tendering portal, MyTenders, to manage this procurement process.

### **1.3 Confidentiality**

- 1.3.1 The information contained within this ITT is made available by the Trust on condition that bidders shall not use the information for any purpose other than when preparing a bid or deciding whether to bid.
- 1.3.2 Bidders shall ensure that any Bidder Party who receives any of the information is made aware of, and complies with, the provisions herein as if they were a Bidder.
- 1.3.3 The Trust may disclose detailed information relating to bids to the Trust directors, officers, employees, agents or advisers and they may make the bid available for inspection by the Trust directors, officers, employees, agents or advisers.
- 1.3.4 The Trust also reserves the right to disseminate information that is materially relevant to all Bidders, even if the information has only been requested by one Bidder, subject to the duty to protect any Bidder's commercial confidence in its bid. The provisions for sharing information and for managing confidentiality are set out in sections 2.4 of this ITT.
- 1.3.5 The Trust will act reasonably in regards to the protection of commercially sensitive information relating to the Bidder, subject to the Trust's duties under the Freedom of Information Act (2000) and the Environmental Information Regulations (2004).

### **1.4 Accuracy of the information and Liability of the Trust and their Advisers**

- 1.4.1 Information provided to Bidders has been prepared by the Trust in good faith but does not purport to be comprehensive or to have been independently verified. Bidders should not rely on the detailed information contained in this ITT and should carry out their own due diligence checks and verify the accuracy of the detailed information contained in this ITT. Nothing in this ITT is, or should be construed as, a promise or representation as to the future.
- 1.4.2 Bidders considering whether to enter into a contractual relationship with the Trust should make their own enquiries and investigations of the Trust's requirements beforehand. The subject matter of this ITT shall only have contractual effect when and to the extent it is contained in the express terms of an executed contract.
- 1.4.3 None of the Trust's directors, officers, employees, agents or advisers make any representation or warranty as to (save in the case of fraudulent misrepresentation) accept any liability or responsibility in relation to, the adequacy, accuracy, reasonableness or completeness of this information or any part of it (including but not limited to loss or damage arising as a result of reliance by the Bidder on this information or any part of it).

### **1.5 Conflicts of Interest**

- 1.5.1 The Trust requires all actual or potential conflicts of interest (including in particular those arising where a member of its supply chain or any adviser put forward by one Bidder is the same firm or company or is a member of the same group of companies as that put forward by another Bidder or is working for the Trust on this or similar schemes) to be resolved to the Trust's satisfaction prior to the delivery of the Bidders' bid in response to this ITT. Failure to declare such conflicts and / or failure to address such conflicts to the reasonable satisfaction of the Trust could result in a Bidder being disqualified from the tender process.

- 1.5.2 In accordance with the rules of the Education Funding Agency, the Trust have adopted a policy of not procuring goods or services from any organisation which is itself a related party or wherein any person considered to be a Person of Significant Control is connected with the Trust or any officer or employee thereof.
- 1.5.3 Any Bidder which is concerned that it is or may be a related party should contact the Procurement Lead by posing the query as a question through myTenders and inform them of the nature of the relationship prior to submitting a bid. **This information will remain confidential and not shared with other bidders.**
- 1.5.4 Any Bidder that fails to disclose a relationship will be disqualified from the tender process.

## 1.6 Canvassing

- 1.6.1 The Trust reserves the right to disqualify (without prejudice to any other civil remedies available to the Trust and without prejudice to any criminal liability which such conduct by a Bidder or a member of its supply chain may attract) any Bidder or a member of its supply chain who, in connection with this ITT:
- Offers any inducement, fee or reward to any member or officer of the Trust or any person acting as an adviser for the Trust in connection with this ITT;
  - Does anything which would constitute a breach of the Prevention of Corruption Acts 1889 to 1916 or of the Bribery Act 2010;
  - Canvasses any of the persons referred to above in connection with this ITT; or
  - Contacts any member or officer of the Trust prior to the notification of a decision about any aspect of this ITT in a manner not permitted by this ITT (including without limitation contact for the purposes of discussing the possibility of their future employment or engagement by the Bidder).

## 1.7 Non-Collusion

- 1.7.1 The Trust reserves the right to disqualify (without prejudice to any other civil remedies available to the Trust and without prejudice to any criminal liability which such conduct by a Bidder may attract) any Bidder who, in connection with this procurement:
- Fixes or adjusts the amount of their bid by or in accordance with any agreement or arrangement with any other Bidder (other than a member of its own consortium or own supply chain members);
  - Enters into any agreement or arrangement with any other Bidder or that Bidder's supply chain members to the effect that they shall refrain from making a bid, or they agree the amount of any bid to be submitted;
  - Causes or induces any person to enter such agreement as is mentioned or to inform the Bidder or any member of that Bidder's supply chain of the amount or approximate amount of any rival bid;
  - Offers or agrees to pay or give, or does pay or give any sum of money, inducement or valuable consideration directly or indirectly to any person for doing or having done, or causing or having caused to be done, any act or omission in relation to any other bid or proposed bid for this procurement; or
  - Communicates to any person other than the Trust the amount or approximate amount of their proposed bid (except where such disclosure is made in confidence in order to obtain quotations necessary for the preparation of a bid).

## **1.8 Intellectual Property**

1.8.1 The copyright in this and all other issued documents is vested in the Trust and may not be reproduced, copied or stored in any medium without the prior written consent of the Trust except in relation to the preparation of a bid. All documentation supplied by the Trust in relation to this procurement is and shall remain the property of the Trust and must be returned on demand, without any copies being retained.

1.8.2 The Trust reserve the right to require the assignment or grant of a royalty free non-exclusive licence of all intellectual property relating to or in connection with any bid resulting in the award of contract to the relevant Bidder.

## **1.9 Publicity**

1.9.1 Bidders and all members of the Bidder's supply chain shall not undertake (or permit to be undertaken) at any time, whether at this stage or after finalisation of the tender process, any publicity activity with any section of the media in relation to this procurement other than with the prior written agreement of the Trust. Such agreement shall extend to the content of any publicity. In this paragraph, the word "media" includes (but without limitation) radio, television, newspapers, trade and specialist press, the internet and email accessible by the public at large, and the representatives of such media.

## **1.10 The Trust's Right to Reject Bids**

1.10.1 The Trust reserves the right to reject or disqualify a Bidder and / or a member of its supply chain where:

- A bid is completed incorrectly, is materially incomplete or fails to meet the Trust's submission requirements which have been notified to Bidders;
- The Bidder contravenes any of the terms and conditions of this procurement.

1.10.2 The disqualification of a Bidder will not prejudice any other civil remedy available to the Trust and will not prejudice any criminal liability that such conduct by a bidder may attract.

## **1.11 Right to Cancel or Vary the Process**

1.11.1 The Trust reserves the right:

- To cancel or withdraw from the tender process at any stage;
- To alter the timetable to contract award;
- Not to award a contract;
- To require a Bidder and / or a member(s) of its supply chain to clarify their submission in writing and / or provide additional information (failure to respond adequately may result in a Bidder not being successful); and / or
- Amend the terms and conditions of the tender process.

## **1.12 Provision of Further Information by Bidders Prior to Submitting a Bid**

1.12.1 The Trust may rely on the information provided by Bidders during their appointment (including but not limited to information concerning the members and structure of any consortium). If, at any time during this tender process there are any material changes to

the same, the Bidder must advise the Trust in writing as soon as practicable providing full details of the change (even if this is prior to the submission of a bid).

1.12.2 The Trust reserves the right to request further information about the Bidder and / or its supply chain at any time during the procurement.

1.12.3 Upon receipt of such information, the Trust shall be entitled to revisit the selection and / or evaluation of the Bidder and exclude the Bidder, if necessary, as a result of that process.

### **1.13 Freedom of Information**

1.13.1 The Freedom of Information Act (2000) and the Environmental Information Regulations (2004) impose duties of openness on the Trust that will have an effect upon how they treat procurement information.

1.13.2 Further information on this and on how the Trust will deal with these issues is available from the trust.

1.13.3 Bidders should satisfy themselves as to the implications of the Freedom of Information Act (2000) and the Environmental Information Regulations (2004) and seek legal advice as necessary.

### **1.14 Governing Law**

1.14.1 All communications will be conducted, and all documents will be prepared, in the English language. The communications and all subsequent contracts executed will be subject to English law and the exclusive jurisdiction of the English courts.

### **1.15 Contact Information**

#### Point of contact for this procurement process

1.15.1 All contact regarding this procurement shall be carried out via the myTenders portal.

#### Complaints regarding the procurement process

1.15.2 Any complaints regarding the procurement process should be made in writing and directed as follows:

Laura Fisher, Head of Business Support, [laura.fisher@limetrust.org](mailto:laura.fisher@limetrust.org)

## **2.0 INSTRUCTIONS TO BIDDERS**

Bidders are deemed to understand the processes that the Trust is required to follow under the Public Contracts Regulations (2015) and all applicable European and domestic legislation so far as they relate to this ITT.

### **2.1 Scope**

2.1.1 Hornbeam Academy for the Lime Trust is split across two sites, which require urgent re-roofing works as described in the tender documents.

All works are to be carried out during the dates stated.



The bidders are invited to submit an offer for one or two of the projects at William Morris and Brookfield House Campus's. The Trust reserves the right to procure the lots to one main contractor, or separately to two contractors,

Due to budget constraints it is possible that not all the work items within each lot will be progressed.

- 2.1.2 Bidders must demonstrate that they have public liability insurance cover of at least £10 million (ten million pounds sterling), professional indemnity insurance cover of at least £5 million (five million pounds sterling), and, employer's liability insurance cover of at least £5 million (five million pounds sterling) or would commit to obtain this if awarded a contract.
- 2.1.3 Bidders are able to attend the academy for a site visit at **7am on 23<sup>rd</sup> March 2021** in order to fully appreciate the extent of the works required. It is not a requirement to attend this site visit but you may be at a disadvantage if you do not attend. Bidders can ask clarification questions at the site visit and also have the facility to ask them via the myTenders eTendering portal. Bidders should notify the Technical Advisor, Sonia Lane (sonialane@ramconsultancy.co.uk) of their intention to attend the site visit (providing the names of a maximum of two personnel per bidder) by **midday on Friday 19<sup>th</sup> March**.
- 2.1.4 The Provider's site supervisor will need to comply with the academy's safeguarding procedures and policies as detailed in Annex C - Safeguarding Checklist. Enhanced DBS clearance will be required for that person only.
- 2.1.5 The intention is to contract the works under the JCT Contract as described in the tender documents
- 2.1.6 Bid submissions should be made using the documentation and directions given in this ITT and associated documents and the supplier response document

## **2.2 Procedure and Dates for Submission of Bids**

- 2.2.1 Bidders are invited to submit their bids to the Trust by the Bid Response Deadline stated in section 3.3 – Bid Timetable.
- 2.2.2 The Trust reserves the right to extend the Bid Response Deadline at any time.
- 2.2.3 The Trust will evaluate the bids by applying the evaluation criteria, which is set out in section 4 of this ITT.
- 2.2.4 Following receipt of bids, the Trust may request clarification of those bids in order to enable the evaluation to be completed. Bidders will not have the opportunity to revise their bids after the Bid Response Deadline.
- 2.2.5 Following receipt of bids and after any clarification, the Trust will evaluate the bids received by applying the evaluation criteria and may select a successful Bidder to be appointed.
- 2.2.6 All bids must be uploaded to the myTenders portal.

## **2.3 Liaison**

2.3.1 All contact regarding the tender should be carried out via the myTenders questions/clarification facility. Responses to any such contact will be distributed to all prospective bidders who have shown an interest in the opportunity unless the information is in relation to sections 1.5.3 & 2.4.3 - the rules in section 2.4 will apply accordingly. Any attempt to liaise via any other party, or use a communication method other than the electronic tendering portal, may result in the Bidder being disqualified from the tender process.

## **2.4 Information Available to Bidders**

2.4.1 All information initially available to Bidders is contained within this ITT.

2.4.2 Bidders may submit questions and requests for clarification or further information up until the final date for clarifications as detailed in section 3.3 - Bid Timetable.

2.4.3 The Trust's policy in respect of sharing information is that all questions and requests for clarification or further information, and the corresponding responses, will be circulated to all Bidders on an anonymous basis. Therefore, should Bidders wish to avoid such disclosure the request must be clearly marked "In confidence - not to be circulated to other Bidders" and the Bidder must set out the reason(s) for the request for non-disclosure to other Bidders.

2.4.4 If the Trust considers that, in the interests of open and fair competition, it is unable to respond to the question or request for clarification or further information on a confidential basis, it will inform the Bidder who has submitted it. The Bidder must as soon as practicable thereafter respond in writing requesting that either the query be withdrawn or be treated as not confidential. The Trust will deem that the question or request for clarification or further information has been withdrawn if the Trust are not contacted in writing within 3 Business Days following the Bidder being so informed.

## **2.5 Costs and Expenses**

2.5.1 Any costs or expenses incurred by any Bidder, or other person throughout the process, will not be reimbursed by the Trust and neither the Trust nor any of their representatives will be liable in any way to any Bidder or other person for any costs, expenses or losses incurred by any Bidder or other person in connection with this tender process including the possibility of being required to formally present their bid.

## **3.0 EXPLANATION OF BIDS REQUIRED**

### **3.1 General**

3.1.1 This section provides Bidders with details of the form and content of bids that are invited.

3.1.2 If a Bidder does not comply with any of these requirements, the Trust may, in its sole discretion, disqualify the bid of that Bidder.

3.1.3 Bidders should ensure that bids are submitted in good time to prevent delays caused by technology failures.

### **3.2 Number, Type, Format and Content of Bids**

- 3.2.1 Each Bidder shall be invited to submit a bid in accordance with the process described in this ITT
- 3.2.2 Each bid shall be submitted electronically in either a Microsoft Word or Adobe PDF format using the template provided. If submitted in pdf format, a Word version must be made available upon request.
- 3.2.3 All pages of the submission must be sequentially numbered.
- 3.2.4 Bids should be as concise as possible, whilst providing sufficient information to enable the Trust to evaluate.
- 3.2.5 Bid wording should be unambiguous, and directly address the requirement stated.
- 3.2.6 All bids, correspondence and documents must be submitted in English.
- 3.2.7 All references to costs/rates must be submitted in pounds sterling with the rates firm for the duration of the contract and not be subject to any variation unless provided for in the conditions of contract.
- 3.2.8 For a bid to be considered by the Trust, the Bidder should ensure that it is compliant with all the requirements and assumptions set out in this ITT, even where Bidders disagree with any such requirements and assumptions. The only exception is if the Trust specifically amends any point during the tender process.
- 3.2.9 All supporting documentation should be provided separately and be given an appropriate filename and document title to make it clear what it is.
- 3.2.10 If Bidders submit a generic policy or similar document, they must indicate clearly the page and paragraph reference that is relevant to a particular part of the bid.
- 3.2.11 Any deliberate alteration of the Trust's requirement within the bid will result in it being rejected unless such amendment has been previously agreed in writing following the liaison procedures set out in section 2.3 of this ITT.
- 3.2.12 Should any part of the bid be ambiguous or open to interpretation, the evaluation panel will seek clarification in writing from the Bidder via e-mail before completing the evaluation of the bid.

### 3.3 Bid Timetable for the tender process

Milestone Description	Date
ITT published	6 <sup>th</sup> June 2021
Notify TA of the intention to attend site visit	6th May 2021 ~
Site visit	<b>To be agreed with RAM</b>
Final date for submission of clarifications	17th June 2021
Deadline for the Trust to respond to clarification questions to be sent to all bidders	22nd June 2021
<b>Bid Response Deadline</b>	30 th June 2021
All Bidders notified of decision & contract award	July 2022

Contractor's mobilisation, Design period, Early orders	July 2022
Contract commencement on site	July 2022
Contract completion by	October 2022

3.3.1 The Trust reserves the right to amend the timetable set out above or extend any time period.

3.3.2 Bids must remain open for acceptance for a period of forty-five days from the Bid Response Deadline. A bid not valid for this period may be rejected by the Trust.

#### **4.0 BID EVALUATION AND CONTRACT AWARD**

4.1 All bids will be opened / downloaded at the same time. Each bid will be scored in accordance with the formula and protocol set out/referred in this section 4 and the results summarised by the Trust's Technical Advisor. The results will then be presented to the Trust's Projects Team and Head of Procurement to confirm the appointment of the most economically advantageous bid based on the scores awarded during the evaluation.

#### **4.2 Evaluation Methodology**

The requirements set out/referred to in the Supplier Response Document and associated documents are deemed essential and must be provided to ensure your bid is considered. Bidders must demonstrate their ability to meet all of these requirements. If a Bidder fails to do so, they will be deemed non-compliant and will be excluded from the procurement process.

#### **EVALUATION CRITERIA:**

See Annex A

## Annex A- Evaluation Criteria

A1.1 Lime Trust is not bound to accept the lowest or any Tender Submission and reserves to itself the right at its absolute discretion to accept or not accept any Tender Submission.

A1.2 Lime Trust will evaluate Tender Submissions on the basis of the most economically advantageous tender, which will be assessed on the following weighted criteria:

**Cost 70% : Quality 30%**

A1.2.1 The quality criteria of 30% will be evaluated through an assessment of your written responses to the quality questions you submit via the myTenders Portal.

A1.2.2 The 30% Quality weighting will be scored as follows and as detailed within the following Table A.

**Table A**

Weighting	Criteria
Question 2 (10)	<b>Experience &amp; Qualification</b> Please provide 2 examples of relevant experiences completed in the past 3 years. Relevant experience may include: work for a secondary school / Academy; delivery of similar works. Please also provide the CV of the Project Manager / Lead person who will be responsible for the delivery of the design and construction phases.
Question 1 (10)	<b>Outline Programme</b> Please provide a draft programme of work / list of dates showing your proposed phasing of the works and key milestones to ensure the works are delivered within the defined dates. You can attach a Gantt chart programme or provide a table of dates, and use the below response box for any supporting comments.
Question 3 (5)	<b>Method Statement</b> Provide a method statement explaining your quality control systems, including management of sub-contractors' work, to ensure all materials and workmanship meet the standards required by the Employer and your system to respond to any defects arising after practical completion
Question 4 (5)	<b>Health &amp; Safety</b> Please provide examples of successful H&S measures you put in place on similar projects to ensure the safety of all those on site (students, staff, visitors and operatives). Explain which measures you foresee for this project.

A1.3 The scoring for quality questions will be in accordance with the methodology illustrated in Table B below:

**Table B –Scoring Methodology - (Qualitative Questions)**

Rating	Score	Level	Comment	Summary
FAIL	0	Non-existent	Insufficient information provided or does not meet the Lime Trust’s requirements	Not acceptable
	1	Extremely poor	An extremely poor, well below expectation response: there is a lack of content / explanation in addressing each of the requirements; AND/OR most proposals are unrealistic / unjustified / unsupported or lack significant content / explanation; AND/OR a very significant proportion of proposals are unacceptable from a risk perspective; AND/OR a significant degree of failure to demonstrate technical and commercial aspects.	Much less than acceptable, major areas of weakness
	2	Very poor	A very poor, below expectation response: there is a lack of content / explanation in addressing each of the requirements; AND/OR some proposals are unjustified / unsupported or lack significant content / explanation; AND/OR a significant proportion of proposals are unacceptable from a risk perspective; AND/OR a degree of failure to demonstrate technical and commercial aspects.	
	3	Poor	A poor, below expectation response: Not many requirements are addressed; AND/OR proposals lack significant content / explanation; AND/OR many proposals are unacceptable from a risk perspective; AND/OR many proposals lack an acceptable approach to technical and commercial aspects.	Less than acceptable, more weaknesses than strengths
	4	Weak	A weak, below expectation response: Very few requirements are addressed; AND/OR proposals lack significant content / explanation; AND/OR some proposals are unacceptable from a risk perspective; AND/OR some proposals lack an acceptable approach to technical and commercial aspects	

Rating	Score	Level	Comment	Summary
PASS	5	Adequate	An adequate response that barely meets expectation: A few requirements are addressed; proposals have a reasonable level of content / justification and explanation; proposals should be acceptable from a risk perspective; an acceptable approach to technical and commercial aspects.	Acceptable, but with some minor areas of weakness
	6	Quite good	Quite a good response that meets expectation: Some requirements are addressed; proposals have a reasonable level of content / justification and explanation; proposals should be acceptable from a risk perspective; an acceptable approach to technical and commercial aspects.	
	7	Good	A good, above expectation response: Many requirements are addressed; proposals have a good level of content / justification, explanation and risk perspective; a good / sound approach to technical and commercial aspects.	Highly acceptable, strong with few weaker areas
	8	Very good	A very good, above expectation response: Most requirements are addressed; proposals have a very good level of content / justification, explanation and risk perspective; a good / sound approach to technical and commercial aspects.	
	9	Excellent	An excellent response: Vast majority of requirements are addressed and most of the bidder's proposals include sound, innovative suggestions; proposals are quite detailed in content / justification and explanation; proposals are highly acceptable from a risk perspective; an outstanding approach to technical and commercial aspects which delivers more than expectations supported by evidence.	Extremely acceptable, many strengths, no weaknesses
	10	Exceptional	An exceptional response: All requirements are addressed and all of the bidder's proposals include sound, innovative suggestions; proposals are very detailed in content / justification and explanation; proposals are highly acceptable from a risk perspective; an outstanding approach to technical and commercial aspects which delivers more than expectations supported by evidence.	

- A1.4 Lime Trust reserves the right to enter into discussions with Tenderers concerning any aspects arising from this invitation to tender after the submission of the Tenders. Such discussions may include, (but are not limited to), the level and application of the rates, prices and financial arrangements contained within any Tender.
- A1.5 Lime Trust reserve the right to negotiate with contractors on the basis of award one or more projects.
- A1.5 You will be required to give a demonstration of your competence to carry out the specified Works at a time and venue to be agreed with the Technical Advisor and Lime Trust Project Team. Such a demonstration shall be conducted by the person you propose to nominate as the Contractor's Representative if your Tender is successful.
- A1.6 You should include within your rates all appropriate costs, expense and disbursements (exclusive of VAT); the cost for complying with the Conditions of Contract, general obligations to the requirements of the Specifications and all other items of work necessary to provide the Service to the reasonable satisfaction of the Authorised Officer, together with all liabilities and obligations, whether expressed or implied, incurred by or incumbent upon you pursuant to the Contract; and to any works required being undertaken safely, and in compliance with all Statutory provisions and other rules or regulations relating to the Contract, including the Health and Safety at Work etc. Act 1974 and any subsequent safety legislation.
- A1.7 You should be aware of all relevant legislation, Home Office and other guidance circulars. In particular, you may be required to ensure that the staff appointed are suitable with due regard to the Rehabilitation of Offenders Act 1974, from which staff would be exempt by virtue of the Rehabilitation of Offenders Act 1974 (Exemptions) Order 1975. The Lime Trust may require all employees so engaged to accept vetting by the Lime Trust before any Contract can be awarded.
- A1.8 The score for Quality questions will be calculated as follows:
- A1.8.1 Scores out of 10 will be given in accordance with Table B for the qualitative questions.
- A1.8.2 The weightings listed in Table A will then be applied to these scores to give an overall score for Quality.
- NB All bids will be scored using the same methodology.
- A1.9 The score for Price will be calculated as follows:
- A1.9.1 The Lime Trust will evaluate the tender price submission using the following relative formula, acknowledging the price has a weighting of 60%:

**For each lot**, the Bidders' prices will be evaluated as follows:

The supplier offering the lowest overall lump sum price, will be awarded a maximum score of 60; and other Bidders' prices will be scored using the following relative formula:

$$\frac{\text{Lowest price tendered}}{\text{Price tendered}} \times 60 = \text{Score}$$

In addition to the scoring an affordability test will be undertaken and together with the scores a judgement will be made which provider offers the most economically advantageous tender.



- A1.10 The scores for Quality and Price will be added together to give a total score out of 100 for each lot.
- A1.11 Once added together the expectation is that the bidder with the highest overall score for a lot is selected as the preferred bidder (for this lot) as they would have demonstrated the most economically advantageous tender.
- A1.12 Lime Trust may exclude bids which are priced too low to be credible, i.e. abnormally low bids.

# Supplier Response Document

## Tender for Lime Academy –Brookfield House – Heating Upgrades

### Section 1: Bidder Information

Company Name	
Company web address	
Company registration	
Contact name	
Contact email address	
Contact telephone number	
Contact address	

### Section 2: Previous Experience and References

	<p><b>Previous Experience and Referees</b></p> <p>Please provide details of <b>two</b> references which are relevant to our requirement which highlights the depth of your experience and expertise.</p> <p><b>PLEASE NOTE:</b></p> <ul style="list-style-type: none"><li>● For contracts in place or recently completed during the past three years.</li><li>● The named contact provided should be able to provide written evidence to confirm the accuracy of the information provided and by providing their contact details you have gained their approval to act as a referee.</li><li>● The information supplied will be treated in the strictest confidence and only used for the purpose of evaluating bids</li><li>● It is preferable to have projects based in the education sector if possible.</li></ul>
	<b>Reference 1</b>
<b>Name of customer organisation</b>	
<b>Point of contact in the organisation</b>	

<b>Position in the organisation</b>	
<b>E-mail address of contact</b>	
<b>Telephone contact</b>	
<b>Type of organisation</b>	
<b>Nature of service provided – these should be relevant to our requirements</b>	
<b>Completion date</b>	
<b>Budget</b>	

	<b>Reference 2</b>
<b>Name of customer organisation</b>	
<b>Point of contact in the organisation</b>	
<b>Position in the organisation</b>	
<b>E-mail address of contact</b>	
<b>Telephone contact</b>	
<b>Type of organisation</b>	

<b>Nature of service provided – these should be relevant to our requirements</b>	
<b>Completion date</b>	
<b>Budget</b>	

### Section 3: Mandatory Requirements (Pass/Fail Criteria)

For pass/fail criteria, if your answer is no, your bid will not be considered.

<b>3.1 – Constructionline Membership</b>	<b>Pass/Fail</b>
Does your company hold current Constructionline membership? Or equivalent If yes, please ensure your bid includes evidence of this	Yes/No

<b>3.2 – Insurance Cover</b>	<b>Pass/Fail</b>
We've provided a copy of our certificate to evidence public liability insurance cover of at least £10M or have provided a statement of commitment to obtain?	Yes / No
We've provided a copy of our certificate to evidence employer's liability insurance cover of at least £5M or have provided a statement of commitment to obtain?	Yes / No
We've provided a copy of our certificate to evidence professional indemnity insurance cover of at least £5M or have provided a statement of commitment to obtain?	Yes / No

<b>3.3 – Safeguarding and DBS</b>	<b>Pass/Fail</b>
We confirm that the proposed site supervisor will comply with the academy's safeguarding procedures and policies and a safeguarding checklist with enhanced DBS clearance will be in place.	Yes/No

<b>3.4 – Form of Contract</b>	<b>Pass/Fail</b>
We confirm a willingness to contract under JCT Minor Works Contract 2016 with Contractor's Design (MWD)	Yes/No

## Section 4: Qualitative Criteria:

<b>4.1 – Previous Experience</b>	<b>Weighting – 10%</b>
Please provide 2 examples of relevant experiences completed in the past 3 years. Relevant experience may include: work for a secondary school / Academy; delivery of similar works. Please also provide the CV of the Project Manager / Lead person who will be responsible for the delivery of the design and construction phases.	

<b>4.2 - Programme</b>	<b>Weighting – 10%</b>
Please provide a draft programme of work / list of dates showing your proposed phasing of the works and key milestones to ensure the works are delivered within the defined dates. You can attach a Gantt chart programme or provide a table of dates, and use the below response box for any supporting comments.	
<b>Response:</b>	

<b>4.3 – Method Statement</b>	<b>Weighting – 5%</b>
Provide a method statement explaining your quality control systems, including management of sub-contractors' work, to ensure all materials and workmanship meet the standards required by the Employer and your system to respond to any defects arising after practical completion	
<b>Response:</b>	

<b>4.4 – Health and Safety</b>	<b>Weighting – 5%</b>
Please provide examples of successful H&S measures you put in place on similar projects to ensure the safety of all those on site (students, staff, visitors and operatives). Explain which measures you foresee for this project.	
<b>Response:</b>	

## Annex C – Safeguarding Checklist

### On Your Company Headed Paper

Dear [Academy Contact],

I confirm that all (your Company name) staff are recruited in line with DfE guidance:

**'Keeping Children Safe in Education'** (September 2019):

<https://www.gov.uk/government/publications/keeping-children-safe-in-education--2>

### This includes the following vetting procedures:

- A face to face interview, assessing candidate's suitability to work with children and young people;
- Identity checks in-line with the DBS regulations;
- Proof of Address;
- Proof of National Insurance Number;
- Proof of Qualifications (where these are a requirement of the job);
- Enhanced DBS Check;
- Overseas Police check (if applicable);
- Barred List check (formerly List 99);
- Confirmation of eligibility to work in the UK (Right to Work Check);
- A minimum of 2 references;
- Medical Check – confirmation that each candidate is medically fit to work in an Education setting;
- Full employment history check – including covering any gaps or discrepancies;
- Disqualification Declaration (for certain categories of staff working with children aged 8 years and under) -  
<https://www.gov.uk/government/publications/disqualification-under-the-childcare-act-2006>;
- Read and understand, 'KCSiE – Information for all school and college staff (Part 1) –  
<https://www.gov.uk/government/publications/keeping-children-safe-in-education--2>
- Attended Safeguarding Training within the last 12 months

Yours sincerely

*SIGNATURE*

(Company representative)

### Company Logo



Name: \_\_\_\_\_





## PRELIMINARIES AND FORM OF TENDER

**PROJECT NO:**  
22411

**DATE:**  
21/05/2022

**AUTHOR:**  
HC

**PROJECT:** Boiler and Heating Distribution

**ADDRESS:** Lime Academy Hornbeam – Brookfield House, Alders Avenue,  
Woodford Green, IG8 9PY

**CLIENT:** Lime Academy

LEAK INVESTIGATION

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SERVICES

BUILDING SURVEYING



## Document Control Sheet

Project Title: Brookfield House Campus – Heating Project

Report Title: Pre-Construction Information

Revision: 01

Status: Final

Control Date: 21/05/2022

### Record of Issue

Issue	Status	Author	Date	Check	Date
1	Final	HC	20/05/2022	JH	21/05/22

### Distribution

Organisation	Contact	Copies
Client		One
Tendering Contractors		One
Contract administrator		One

## 1. EXECUTIVE SUMMARY

### 1.1 – Tender Programme

Date	Stage
25/05/2020	Invitation to Tender
24/06/2020	Tender Return Date
WC 27 <sup>th</sup> June	Tender Evaluation
July 2022	Contractor Appointment
+ 2 Weeks	CDM Planning Period
July 2022	Start on Site
12 Weeks from date of possession	Completion and Project Handover

When the successful contractor has been notified, they shall provide a delivery programme to highlight commencement and completion of the works over the 10-week contract period. Should the contractor not agree with the time scales associated they must declare this on their delivery programme.

### 1.2 - Obligations to Tenderer and Tender Pricing Documents

Tenderers must ensure that they are fully familiar with the nature and extent of the obligations of the Instructions to Tenderers and Conditions of Tender, Tender and Pricing Document and be aware that the performance standards will be strictly enforced. The Tenderer will be deemed to have read, examined and accepted the Instructions to Tenderers, Tender and Pricing Document and the requirements contained therein prior to the submission of the Tender. It is the responsibility of Tenderers to obtain themselves, at their own expense, all information necessary for the preparation of their tender.

1.2.1 - This Invitation to Tender is intended for the addressee only. If you intend using Sub-contractors to help fulfil the Contract, this must be clearly stated within your response.

### 1.3 – Accuracy

You are advised to check the accuracy of your Tender prior to submission.

### 1.4 Form of Submission

The Form of Tender must be submitted duly signed. Any items for which you are unable to offer a price should be identified. Any other revisions to the Tender may invalidate the tender submitted.

### **1.5 Expenses/ Losses**

The Client will not be responsible for payment of costs, expenses or losses which may be incurred by any Tenderer in the preparation and submission of their Tender, including site visits, attending pre or post contract presentations/ interviews or negotiations in connection therewith.

### **1.6 Format of Tender Submissions**

All tenders are to be returned to the Client as detailed in section 1.16 of this document.

The Client cannot undertake to give consideration to any tender submitted otherwise, including telephone, email, and facsimile.

The closing time and date for receipt of tenders is \*\*\*\*. Any tender submissions received after the closing date will be rejected. Suppliers must ensure that they leave adequate time prior to the closing date to submit their response.

Tenders not in accordance with these instructions will be rejected.

Tender responses will not be opened until after the closing date for receipt of tenders has elapsed.

### **1.7 Unsuccessful Tenders**

Notification of proposed award of contract will be given to all tenders during which time, unsuccessful tenderers may request a de-brief from the Client in respect of their tender submission and evaluation itself.

### **1.8 Successful Tender**

An authorised representative from the Client Company (or approved representative) will notify the successful tenders.

### **1.9 Invitation to Tender Material**

ITT material means information issued to the Tenderer by the Client or on its behalf, or to which the Tenderer has been given access, for the purposes of this ITT. ITT material remains the property of the Client or other owners and is released solely for the purpose of tendering.

Return of ITT Material: In the event that a recipient of ITT Material decides not to participate in the submission of a tender, the ITT Material shall be returned to its place of issue without delay. If a tender is submitted to the Client, the ITT Material may be retained by the Tenderer until the result of the competition is known. In the event that the Tenderer's bid is unsuccessful the ITT Material shall be returned to its place of issue without delay. This will not apply to written material as it is sent out electronically.

Intellectual Property Rights in ITT Material: The Intellectual Property in ITT Material will belong to the Client or a third party. The ITT Material may only be used for the purpose of responding to this ITT and shall not be copied or disclosed to anyone other than employees of the Tenderer involved in the preparation of the tender, without the prior written approval of the Client. Client or the third-party owner may suffer damage for which compensation may be sought from a Tenderer, if the Tenderer discloses the ITT Material other than

to employees involved in the tender preparation or uses the ITT Material other than for the purpose of tendering.

#### **1.10 Consultants, Contractors, Sub-Contractors and Suppliers**

It is the responsibility of Tenderers to provide proposed Sub-Contractors and Suppliers where applicable for all the technical and commercial information necessary to allow those potential Sub-Contractors and Suppliers to provide their proposals to the Tenderer. Client will not answer to any direct approach from such potential Sub-Contractors and Suppliers for details of any particular Invitation to Tender.

Tenderers are required to submit with their tender a schedule of all proposed Sub-Contractors, Suppliers and other Service Providers to be involved in the design delivery of the services.

#### **1.11 Errors in Tenders**

Tenderers will be given the opportunity to either stand by any genuine errors in their pricing or withdraw from the tendering process.

#### **1.12 Confidentiality**

Tenderers are to note the following:

They must not communicate any figures or other information indicating tender prices to any third party before the time set for the return of Tenders. (The only exception to this requirement is for the obtaining of insurance quotations, such information to be given in strict confidence).

They must not obtain or try to obtain any information in connection with any other Tender before the time set for the return of Tenders.

They must not make or discuss any arrangement with any third party regarding whether or not they should tender, or about their, or any other party's Tender.

They shall not, without any prior approval in writing, take, or authorise the taking of, any photographs of any project for use in publicity or advertising or publish alone, or in conjunction with others, any articles, photographs or other illustrations relating to any project or any part thereof, nor impart to any publication, journal, newspaper, film or any radio or television programme any information relating to any project.

Tenderers are required to submit a signed 'Declaration' as provided for return with their tender.

#### **1.13 Tender Queries**

During the tender period all queries should be made via :

Sonia Lane at RAM Building Consultancy Limited

email: [Sonialane@ramconsultancy.co.uk](mailto:Sonialane@ramconsultancy.co.uk)

All written tender queries will be endeavoured to be acknowledged within 3 working days.

#### **1.14 Tender Information/ Revisions**

At any time after the issue of the Invitation to tender, the Client reserves the right to issue changes to Tender Information/ requirements. Tenderers, when preparing their submissions, must, as with the information generated by Tender Queries and Responses take these changes into account in drawing offer(s).

No alterations or qualifications to any of the tender documents shall be made unless they have been agreed in writing by the Client.

The purpose of this Invitation to Tender is to elicit an unequivocal bona-fide tender which is capable of acceptance for the purpose of appointing a contractor.

The Tenderers submission should not include any brochures or commercial information.

#### **1.15 Tender Acceptance**

The Client does not bind itself to accept the lowest or any tender and may refuse to consider any Tender which is incomplete or qualified in any way or not completed in strict accordance with the instructions contained within the invitation tender.

#### **1.16 Tender Return Information**

All tender returns must be sent to the following: Return Tender via email and marked as the following:

TENDER: Westminster university – P2 Boiler and Flue Replacement

FTAO Sonia Lane - Managing Director

Email: [sonialane@ramconsultancy.co.uk](mailto:sonialane@ramconsultancy.co.uk)

## 2. PRELIMINARIES

### **JCT MINOR WORKS BUILDING CONTRACT WITH CONTRACTOR'S DESIGN**

The Contract: JCT Minor Works Building Contract 2016 Edition with Contractor Design element within the contract: Allow for the obligations, liabilities and services described.

### **THE RECITALS**

#### **First - THE WORKS**

The work comprises: Replacement of the fire doors to ensure compliance with the schools Fire Risk Assessment and strategy. Upgrades to the emergency lighting and fire alarm to compliant levels have been included. In addition Fire Compartmentation improvements as described in the document.

Location: University of Westminster, 35 Marylebone Rd, London NW1 5LS

#### **Second - CONTRACT DOCUMENTS**

Contract drawings: As listed in Schedule of works Appendix D.

Contractor's Designed Portion – As per works description

Contract documents: The following have been prepared which show and describe the work to be done: Contract Drawings and Contract Specification

#### **Third - PRICED DOCUMENTS**

Documents to be priced or provided by the Contractor: Priced Contract Specification

#### **Fourth – CONTRACT SPECIFICATION**

The Contractor has supplied the Employer with a copy of the priced Contract Specification.

#### **Fifth – THE CONSTRUCTION INDUSTRY SCHEME (CIS)**

The status of the Employer is, as at the Base Date, that stated in the contract particulars

#### **Sixth – THE CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS**

For the purposes of the Construction (Design and Management) Regulations 2015 (the CDM Regulations) the status of the project that comprises or includes the Works is stated in the Contract particulars.

#### **Seventh – FRAMEWORK AGREEMENT**

The Contract is not supplemented by a Framework Agreement.

#### **Eighth – Supplemental Provisions**

1 to 6 is as stated in the contract particulars

## THE ARTICLES

### 3 - ARCHITECT/ CONTRACT ADMINISTRATOR

Architect/ Contract Administrator: See clause A10/140.

### 4 - PRINCIPAL DESIGNER

Principal Designer: See clause A10/150.

### 5 – PRINCIPAL CONTRACTOR

Principal Contractor: See clause A10/130.

## CONTRACT PARTICULARS

### Fifth Recital and Schedule 2 - BASE DATE

**Base date:** Ten days prior to tender return.

### Fifth Recital and clause 4.2- CONSTRUCTION INDUSTRY SCHEME (CIS)

Employer at the Base Date is NOT 'contractor' for the purposes of the CIS.

### Sixth Recital - CDM REGULATIONS

The project is not notifiable.

The Contractor shall provide a construction phase plan whether the project is notifiable or not.

**Seventh Recital – The sixth recital will be deleted.**

### Eighth Recital and Schedule 3 - SUPPLEMENTAL PROVISIONS

**Collaborative working:** Paragraph 1 applies

**Health and safety:** Paragraph 2 applies

**Cost savings and value improvements:** Paragraph 3 applies

**Sustainable development and environmental considerations:** Applies

**Performance indicators and monitoring:** Does not apply

**Notification and negotiation of disputes:** Applies

**Where paragraph 6 applies, the respective nominees of the parties are:**

*Employer's nominee:* \*\*\*\*

*Contractor's nominee:* TBC

Or such replacement as each party may notify to the other from time to time.

## CLAUSES

### Clause 2.3 - COMMENCEMENT AND COMPLETION

Date for Commencement of the Works: (To be agreed)

Date for Completion: 12 weeks from Date of Commencement of the works (to be agreed).

### Clause 2.9 - LIQUIDATED DAMAGES

At the rate of £2,968 per week or part thereof.

### Clause 2.11 - RECTIFICATION PERIOD

Period: Six months from the date of practical completion.

### Clause 4.3 – INTERIM PAYMENTS

The first due date is: One month from commencement of the work, and thereafter the same date in every month or the nearest Business Day in that month.

### Clause 4.3 - PERCENTAGE OF THE TOTAL VALUE OF THE WORK ETC.

Percentage: 95 per cent.

### Clause 4.3 - PERCENTAGE OF THE TOTAL AMOUNT TO BE PAID TO THE CONTRACTOR ON OR AFTER PRACTICAL COMPLETION

Percentage: 97½ per cent.

### Clause 4.3 and 4.8 – FLUCTUATIONS PROVISION

Schedule 2 (Contribution, Levy and Tax Changes): Does not apply. Percentage to be added for Fluctuations Option: N/A

### Clause 4.8.1 - SUPPLY OF DOCUMENTATION FOR COMPUTATION OF AMOUNT TO BE FINALLY CERTIFIED

Period: 1 month from the date of practical completion.

**Clause 5.3 - CONTRACTOR'S INSURANCE - INJURY TO PERSONS OR PROPERTY** Insurance cover (for any one occurrence or series of occurrences arising out of one event): Not less than £10,000,000.00.

### Clauses 5.4, 5.5 & 5.6 - INSURANCE OF THE WORKS ETC – ALTERNATIVE PROVISIONS

Clause 5.6 (Works and existing structures insurance by Employer in Joint Names): Applies



**Clauses 5.6 - INSURANCE ARRANGEMENTS** – details of required policy or policies are set out in the following document (s)

- Joint Named cover to be afforded under the Principal Contractor's insurance using the indemnity to principals clause (the "C1 Replacement Schedule")

**Clauses 5.4 and 5.5 - PERCENTAGE TO COVER PROFESSIONAL FEES**

Addition: 15 per cent.

**Clause 7.2 - ADJUDICATION**

The Adjudicator is: A member of the Royal Institution of Chartered Surveyors. Nominating body: Royal Institution of Chartered Surveyors.

**Schedule 1 paragraph 2.1 - ARBITRATION**

Appointor of Arbitrator (and of any replacement): President or a Vice president of: The Royal Institution of Chartered Surveyors.

**THE CONDITIONS**

SECTION 1: DEFINITIONS AND INTERPRETATION

SECTION 2: CARRYING OUT THE WORKS

SECTION 3: CONTROL OF THE WORKS

SECTION 4: PAYMENT

SECTION 5: INJURY, DAMAGE AND INSURANCE

SECTION 6: TERMINATION

SECTION 7: SETTLEMENT OF DISPUTES

The Contract: Will be executed as a under hand.





### **3. COLLECTION PAGE & FORM OF TENDER**

Collection Page and Form of Tender

	<u>MAIN SUMMARY</u>	£
1.0	GENERAL ITEMS/ PRELIMINARIES	
	1. Welfare	£
	2. Access	£
	3. Stroage	£
	4. General Site Set Up	£
	5. Other	£
2.0 -	BUILDING CONTROL – PROV SUM	£ 2,500
3.0	ASBESTOS	
	1. Asbestos – R&D Survey	£
	2. Asbestos Removal – PROV SUM	£ 10,000.00
4.0	DAY WORK SCHEDULES	£
	<b>DO NOT CARRY FORWARD INFO ONLY</b>	
5.0	ELECTRICAL SERVICES	
	1. Removal/modifications to existing services (plantroom)	£
	2. Control specialists works	£
	3. Electrical/controls for fan convectors	£
	4. Testing and commissioning	£
	5. As-fitted drawings/Operating and Maintenance Manuals	£
6.0	MECHANICAL SERVICES INSTALLATION	
	1. Removal/modifications to existing services	£
	2. LTHW heating installation works	£
	3. H&C water services installation works	£
	4. Thermal insulation	£
	5. Builders-works (boxing and holes)	£

	6. Fire-stopping	£	
	7. Testing and commissioning	£	
	8. As-fitted Drawings/Operating and Maintenance Manuals	£	
	9. Water treatment	£	
	10. 10. Demonstration to the Employer	£	
7.0 -	CONTINGENCY	£	20,000.00
	<b>TOTAL</b>	£	

**ANY ADDITIONAL ITEMS SPECIFIED BY THE CONTRACTOR:**

Please provide an Extra Over Cost for working nights = £

(DO NOT CARRY FORWARD)

*Servicing the building envelope across the entire UK...*

**Tender for:** Lime Academy – Brookfield House Campus – Heating Distribution

**To:** RAM Building Consultancy  
PO Box 1567,  
Bedford,  
MK41 5BH

Email [sonialane@ramconsultancy.co.uk](mailto:sonialane@ramconsultancy.co.uk)

From: .....

Having examined carefully and understood the, Conditions of Tender, Conditions of Contract, the Specification and all other documentation issued by the Employer in connection with the Project.

We agree to **hold this price until September 2022**, and can confirm the programme duration for this project will be ..... **weeks**.

We offer to carry out the whole of the Works as described in and in accordance with the documents referred to in this Tender;

for the sum of £ .....

**NON-COLLUSIVE TENDERING CERTIFICATE**

This is a bona fide tender, intended to be competitive, and that I/we have not fixed or adjusted the amount of the tender by or in accordance with any agreement or arrangement with any other person.

I/We have not done and I/we undertake that I/we will not do at any time before the hour and date specified for the return of this tender any of the following acts:

- a) communicating to a person other than the person calling for those tenders the amount or approximate amount of the proposed tender except where disclosure, in confidence, of the approximate amount of the tender was necessary to obtain premium quotations required for the preparation of the tender.
- b) entering into any agreement or arrangement with any other persons that they shall refrain from tendering or as to the amount of any tender to be submitted.
- c) offering or paying or giving or agreeing to pay or give any sum of money or valuable consideration directly or indirectly to any person for doing or having done or causing or having caused to be done in relation to any other tender or proposed tender for the said work any act or thing of the sort described above. We acknowledge that if we, or anyone who acts on our behalf behaves improperly or commits an offence under the Prevention of Corruption Acts 1889-1916, the Council may cancel the contract and recover all costs and losses.

In this certificate, the word 'person' includes any persons or any-body or associated, corporate or unincorporated, and 'any agreement or arrangement' includes any such transaction, formal or informal, and whether legally binding or not.

Sign and Print : .....





## MECHANICAL SPECIFICATION

RAM REF:  
22411

DATE:  
24/05/2022

AUTHOR:  
JH (MEP)

**PROJECT:** Boiler and Heating Distribution

**ADDRESS:** Lime Academy Hornbeam - Brookfield House, Woodford  
Green, Essex, IG8 9PY

**CLIENT:** Lime Academy

LEAK INVESTIGATION  
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## **PART ONE**

### **INTRODUCTION**

#### **1.1 GENERAL PROJECT DESCRIPTION**

This specification and the project specific drawings detail the works to be undertaken for the proposed heating pipework replacement works project at The Lime Academy Hornbeam, Brookfield House Campus.

##### **Site Details:**

Brookfield House  
Campus 1 Alders Avenue  
Woodford Green  
IG8 9PY  
Telephone: 020 8527 2464  
E-mail: [hornbeamoffice@limetrust.org](mailto:hornbeamoffice@limetrust.org)

This document is divided into the following parts:

1. Introduction
2. Preliminaries and General Conditions
3. Codes, Standards and Advisory Notices
4. Particular Specification
5. General Electrical Specification
6. General Mechanical Specification
7. Schedules

##### **Contract Administrator contact details:**

RAM Building Consultancy – Harry Chater  
Telephone: 0844 335 1822  
Mobile: 07892 723280  
E-mail: [HarryChater@ramconsultancy.co.uk](mailto:HarryChater@ramconsultancy.co.uk)

##### **Building Services Consultants**

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See link to survey photographs:

<https://app.box.com/s/au4jqhfcbyta2ataleooc0nnvntl1fu1>

## **PART TWO**

### **PRELIMINARIES AND GENERAL CONDITIONS**

#### **2.1 DEFINITIONS**

1. The term 'Employer or Client' shall mean: Lime Academy Hornbeam  
Brookfield House  
Campus 1 Alders Avenue  
Woodford Green  
Essex  
IG89 9PY
2. The term 'Contract Administrator' shall mean: RAM Building Consultancy  
Hammond Road  
Elm Farm Industrial Estate  
Bedford  
MK41 0UD
3. The term 'Planning Supervisor' shall mean: TBA
4. The term 'Building Services Consultant' shall mean: RAM Building Consultancy  
Hammond Road  
Elm Farm Industrial Estate  
Bedford  
MK41 0UD
5. The term 'Principal Contractor' shall mean the company appointed to carry out the main contract works.
6. The term 'Specialist Contractor' shall mean the company specified by the Building Services Consultant and then appointed by the Principal Contractor to carry out the works specified within the contract documents.
7. The term 'Specification' shall mean this specification and any further general or detailed specification issued to the Principal Contractor by the Contract Administrator as the works proceed.
8. The term 'Typical Drawings' shall mean the drawings which accompany this specification and are to be used by the Principal Contractor as a guide to the installation required.

9. The term 'Production Drawings' shall mean those drawings prepared by the Principal Contractor, using the Building Services Engineer's Drawings as a base design, and this specification; for the purposes of developing the design, taking of quantities, preparing the tender and from which the Principal Contractor shall carry out the works.
10. Local Authority: means in United Kingdom, the Council of a County Borough, City Borough or a County District, the Common Council of a City of and for the purposes of this specification shall include any other body or organisation exercising statutory or legal authority or rights or empowered by legislation to exercise control over buildings.

## 2.2 CONTRACT

The Contract for the Principal Contract will be confirmed by the Contract Administrator, RAM Building Consultancy.

## 2.3 GENERAL DESIGN CONSIDERATIONS

The complete works are to be installed such that they will give reliable and safe services throughout their operational design life.

The installation shall be such that replacement of parts for maintenance or plant failure can be undertaken with the minimum of interference and inconvenience to the School.

The installation shall be such that all maintenance can be carried out safely.

All parts of the installation will be required to operate satisfactorily on continuous full load or part load for intermittent, short and long periods.

Full compliance with the latest Construction (Design and Management) Regulations is required.

## 2.4 PRINCIPAL CONTRACTOR'S RESPONSIBILITIES

Unless specifically stated to the contrary in the tender, with full supporting explanations, the Principal Contractor will be deemed to have allowed for all equipment and works as shown on the tender documentation, as a responsible Principal Contractor, with the design and layout of the works as being sufficient to ensure reliability and safety in operation, free from undue stress and of satisfactory performance.

### 1. General

The Principal Contractor is to include the whole of the works which are described

in or implied by the specification, all matters not included in this specification

which may be inferred to be obviously necessary for the efficiency, stability and completion of the works shall be deemed to be included in the Principal Contractor's tender return.

Until each section of the Contract has been taken over by the School, the Principal Contractor shall be entirely responsible (save as provided in the Conditions of Contract) for such sections of the Contract, whether whilst the works are being carried out, or during tests, or in use within the defect's liability period.

The Principal Contractor shall ensure they are satisfied that no part of the installation specified is inconsistent with the correct functioning of the installation in service.

Any such inconsistency shall be notified to the Contract Administrator and Building Services Consultant immediately by e-mail.

The Principal Contractor shall include for all equipment necessary for the fulfilment of the guarantee and requirements called for in the specification, whether shown on the drawings or not, and the work shall be executed to the satisfaction of the Contract Administrator.

## 2. Extent of Design

The basic design and requirements necessary to tender the works are covered on the drawings, in the specification, and the schedules.

There are also photographs issued with the documentation to assist the tenderer.

The Principal Contractor shall be required to carry out all detail design, preparation of shop drawings and the like necessary for his operatives to install all the works (unless they consider the Building Services Engineer's drawings adequate for their purposes). The Principal Contractor shall carry out all detail design work and provide the necessary drawings, including builders-work details as required.

## 3. Position of Plant and Sub-Surfaces

The Principal Contractor shall ascertain on site that their work will not foul any other existing building services, building interfaces or fittings.

Any work done which has to be redone due to their negligence in this respect shall be done at the cost of the Principal Contractor.

The Principal Contractor shall, where applicable be satisfied, before commencing their work, as to the suitability of the floor or any other surfaces on which the Principal Contractor is to fix, support, or lay their installation.

If any changes to agreed layouts and/or weights are proposed by the Principal Contractor, then due notice must be given to the Contract Administrator.

## 2.5 SETTING OUT

The marking of all holes, chases, etc., will be the responsibility of the Principal Contractor. The Principal Contractor will be responsible for the correct marking out on constructed work, of all holes, chases, etc., that may be required and shall pay for all unnecessary work carried out due to inaccuracy of marking out or for any other works incurring any additional expense caused by reason of their omission to furnish such information in time for its inclusion in the sequence of work.

## 2.6 DRAWINGS

The Principal Contractor shall be responsible for preparing all working drawings and for the detailed design work necessary for them to complete the manufacture and installation (if required).

The Principal Contractor shall submit working drawings to the Contract Administrator and Building Services Consultant, to an agreed programme, before any manufacture or installation work is commenced.

Working drawings must show all plans, elevations, sections, and details of the construction and installation of the systems (if required).

Such details are to identify and describe all materials, components and finishes associated with the installation.

It is most important that all dynamic movement, fabrication and erection tolerances are clearly stated.

When submitting such drawings for approval the Principal Contractor is to certify that such drawings have been fully examined and that they comply with the requirements of the Contract.

Final comment on the working drawings is to be contingent upon the complete submission of all calculations, documentation, certification and approvals (if required).

The Contract Administrator's comments will relate only to performance, general aesthetic and overall functional matters, not to the detailed design and construction of components, which is to remain the complete and full responsibility of the Building Services Consultant and the Principal Contractor.

The Contract Administrator's consideration of the shop drawings will not relieve the Principal Contractor from his responsibility for errors or for supplying components and materials to the full satisfaction of the Contract Administrator and Building Services Consultant.

Any modification required is to be re-submitted within one week of receipt of the Contract Administrator's comment, or as otherwise agreed on the drawing schedule.

The Principal Contractor is to allow for electronic issue for each of the final working drawings to the Contract Administrator and Building Services Consultant.

The Principal Contractor shall provide detail drawings generally as outlined below:

1. Manufacturer's dimensioned drawings of plant

The drawings shall show all connections, correctly sized, finishes and clearances required for operation, controls etc., removing internal parts and general working clearances.

Internal wiring and schematic diagrams together with external connection drawings shall be included.

The extent and characteristics of any external services to be provided for the proper operation of each item of equipment must be clearly given and terminal connections for continuation properly detailed and identified.

2. Purpose made diagrams detailing separately all composite electric circuits and wiring layouts and hydraulic circuits.

The diagrams shall be fully detailed with terminals for site connections clearly identified.

The Principal Contractor shall be responsible for the accuracy of all diagrams provided and for the correct internal connections of all pre-assembled equipment supplied for the Contract.

They shall also reimburse the full cost of abortive or remedial work due to any error in these respects.

3. Detail builders-work drawings, as may be necessary in addition to those provided by the Contract Administrator showing the whole of the work to be carried out by the Principal Contractor in relation to this Contract.

Drawings are to be in sufficient detail and to such a scale as to enable the Principal Contractor to carry out their work without misunderstanding.

Such drawings shall illustrate holes, ducts, trenches, etc., all fully dimensioned as required.

Drawings are to show all the positions and dimensions of holes, ducts, chases, etc., to be pre-cast, built or cut in floors, roof, walls, ceilings or at any other position for the installation of the work.

Additional drawings showing the size and construction of plinths, bases, special supports or foundations required for equipment including the relevant setting out dimensions for location and finished levels and in particular the sizes, depths and locations of bolt holes.

The Principal Contractor shall be entirely responsible for the accuracy of builders-work drawings and shall at their own expense make good any defects which may arise from any inaccuracies in these.

All drawings are to be in metric dimensions and in 'SI' terminology and units. Electrical symbols shall comply with BS3939.

All drawings on which abbreviations are used shall have a legend.

No work shall start on site unless the Principal Contractor's working drawings have been first approved by all relevant Local Authorities (if required).

Once full approval of working drawings has been gained, the Principal Contractor shall not deviate from the layout shown on the drawings unless the alteration is covered by a written instruction from the Contract Administrator.

The Principal Contractor shall be responsible for providing all installation drawings in good time to meet the agreed programme for the works.

## **2.7 AS INSTALLED DRAWINGS**

The Principal Contractor is to clearly mark, as the job progresses, all changes and deviations from the working drawings.

The drawings are to be available at the site for periodic inspection throughout the duration of the work.

The Principal Contractor must pay particular attention to accurately dimensioning the exact locations of all buried work, and work concealed in inaccessible locations.



When the project is complete and ready for inspection the workings drawings are to be amended as required in accordance with the marked-up drawings.

The Principal Contractor is to submit electronic versions of the 'as-built' drawings to the Contract Administrator and Building Services Consultant for review during the final inspection period; and supply the final prints to the Contract Administrator for the School's use and record, for inclusion in the Operation and Maintenance Manuals.

## **2.8 QUALITY CONTROL AND INSPECTION**

The Principal Contractor is to submit to the Contract Administrator quality control procedures that will be undertaken on site to ensure the design integrity and performance of the Contract installation.

The Principal Contractor is to submit to the Contract Administrator details of the experience and qualification of the Supervisor who will be employed on site to control the installation operations and his capabilities to explain methods and materials to ensure that components are sited and installed in conformance with the Contract documents.

Any replacement of site supervision personnel will be subject to the Contract Administrator's approval.

The Principal Contractor is to permit the Contract Administrator, or their representatives, free access to the Contract work at all times.

Facilities are to be made available for the inspection of any unit, method of manufacture or quality control procedure.

Inspection of work will not relieve the Principal Contractor of their responsibilities for any defects which may subsequently be discovered or for the proper performance of the installation.

Unless specifically stated to the contrary, all materials, plant or apparatus supplied, or work done shall comply with the current British Standards and Codes of Practice.

Where any section of the works is affected by a British Standard or Code of Practice, the requirements shall be met as a minimum, but this provision may be overridden by any specific requirement of this document.

Electrical apparatus supplied by the Principal Contractor, and work in connection with, shall comply with the Requirements for Electrical Installation (Eighteenth Edition) of the Institution of Electrical Engineers.

Wherever the term 'Approved' is mentioned, the Contract Administrator and Building Services Consultant's approval of the goods as selected is to be obtained before the work is commenced.

The workmanship shall be carried out to the entire satisfaction of the Contract Administrator and Building Services Consultant.

Any unsatisfactory work is to be taken down and replaced at the Principal Contractor's own expense.

The Principal Contractor is to ensure that the quantity of each product and material required to complete the work is of consistent kind, size, quality and overall appearance.

They are to handle, store and fix products with care to ensure that they are not damaged when incorporated into the work.

All products used are to be new unless otherwise stated.

## **2.9 TRADE CUSTOM**

The Principal Contractor and all their employees shall comply with all rules, practices and/or local agreements which shall be in force in the area of the site and shall avoid any complications which might cause strikes or trade disputes amongst their own or other operatives.

## **2.10 OVERTIME**

It will be deemed that the Principal Contractor has allowed for the cost of all working that they consider necessary to achieve the required completion date without the need for any overtime.

## **2.11 DAYWORKS**

No dayworks shall be carried out without the written instructions of the Contract Administrator.

All dayworks shall be paid for in accordance with the rates stated by the Principal Contractor in the specification schedules.

The Principal Contractor shall give the Contract Administrator sufficient notice when any dayworks are to be carried out, and the date when it is expected to start.

The Principal Contractor shall render, from day to day, daywork sheets to the Contract Administrator showing the number and names of people so employed, with the number of hours worked, also the detailed quantities of the materials used, so that such daywork sheets may be certified by the Contract Administrator.

## **2.12 SCHEDULE OF PRICED QUANTITIES**

Within fourteen days of the Principal Contractor being informed that their tender is being actively considered for the specified works, they shall provide a fully detailed priced schedule of quantities on which their tender has been based equal in total to the tender submitted if it is requested by the Contract Administrator.

The schedules will be used for evaluating the costs of variations to the works as identified by authorised additions and deletions.

## **2.13 VARIATIONS**

The Principal Contractor will be required to submit a detailed costing, on an ADD and OMIT basis, for all variations within fourteen (14) days of receipt of information which varies the works.

The Principal Contractor will also be required to notify the Contract Administrator as soon as they are aware of, or anticipate, a variation to the works not specifically covered by an Instruction.

## **2.14 FIRE PRECAUTIONS**

Where it is necessary for the Principal Contractor to use naked flame or any other equipment of a hazardous nature in the execution of their work, adequate protection shall be given to all other materials and personnel which may be susceptible to damage as a result of the use of such equipment.

The Principal Contractor shall ascertain whether the School uses a 'Hot Works' Permit to Work process and shall conform with the specific requirements as applicable.

If this is not the case, then the Principal Contractor shall use their own permits (kept on site during the works) and include it within the Operating and Maintenance documentation for record purposes.

Suitable fire extinguishers shall be readily available at the position of such work, provided and maintained by the Principal Contractor.

The suitability of fire extinguishers, and approval of methods of fire precautions are to be approved by the Fire Prevention Officer of the Local Fire Brigade (if required).

There are existing fire alarm detectors in the boiler room and the School which can be covered whilst the works are being carried out but must be in use at all times that the area is not occupied.

## 2.15 **ENVIRONMENTAL DESIGN CONDITIONS**

All equipment and installations shall be suitable for operation under all conditions of temperature and humidity likely to be experienced at site.

### Temperature

The equipment shall be designed for continuous and intermittent operation within an ambient temperature range (for design of plant)  $-10^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ .

### Humidity

All new equipment and the installation shall be suitable for operation with an ambient of 85% RH at  $28^{\circ}\text{C}$ .

### Noise

Irrespective of any specified requirements set out in the specification, or in the absence thereof, each item of plant and equipment shall be reasonably silent in operation.

In particular, no significant degree of noise or vibration shall be discernible outside plant rooms or in spaces where plant or equipment is housed.

The Principal Contractor shall take all necessary steps to ensure compliance with those requirements, and shall include in their tender submission for the provision of fixing of such sound absorbing and/or anti-vibration materials or devices which will achieve a satisfactory degree of silence in operation.

The Principal Contractor shall provide anti-vibration mountings for all panels containing contactors or transformers.

The Contract Administrator's decision as to what constitutes satisfactory compliance in this respect shall be final.

The playing of radios, portable or fixed equipment or recorded sound will not be permitted.

## 2.16 **MANUFACTURER'S NAMEPLATES**

The Principal Contractor shall leave in position, on all equipment, the manufacturer's plate or markings normally attached thereto by the manufacturers.

The Principal Contractor is, however, at liberty to affix to equipment not manufactured by themselves, a plate in a form to be agreed with the Contract Administrator, having the words

'Supplied by.....' giving their name and address.

Under no circumstances must equipment not made by the Principal Contractor be devoid of ready means of identification so that replacement of parts may subsequently be obtained by the School from the actual manufacturer.

## 2.17 LABELS

The Principal Contractor is to supply and fix ivory or similar approved labels to all items of equipment, valves, switches, fuses, etc., which form part of their works and these labels shall bear such identifying information as is considered necessary by the Contract Administrator.

All labels must be secured by screws, rivets or the like. Labels secured by adhesive only will not be acceptable.

## 2.18 CHECKING OF CONNECTIONS PRIOR TO OPERATION

Before the commencement of any energising of equipment and systems all static tests shall be completed, and all connections checked for identification, resistance, continuity and polarity.

Should the Principal Contractor fail to perform such checks which may result in damage this will be construed as negligence, and they shall be liable for consequential loss in addition to replacing or making good the damage to the Contract Administrator's satisfaction.

## 2.19 INSPECTION, TESTING AND PRE-COMMISSIONING

### GENERAL REQUIREMENTS

Inspection, testing and pre-commissioning shall be carried out in accordance with this specification, to generally accepted good practices, all relevant Codes of Practice, British Standards and Regulations.

The procedure for commissioning and testing shall be submitted to the Contract Administrator and Building Services Consultant for approval.

The Principal Contractor shall call upon the Contract Administrator and Building Services Consultant to witness tests when they are completely satisfied that the section of works is ready.

The Principal Contractor shall therefore assure themselves that the works concerned are in

fact ready for testing by conducting routine procedures to ensure that the activities witnessed by the Contract Administrator and Building Services Consultant do not reveal incomplete installation work.

The Contract Administrator and Building Services Consultant reserves the right to inspect and witness all testing and commissioning of the whole or any part of the installations as they so desire, and who may request additional tests when deemed necessary.

The Principal Contractor shall make complete records of the tests as carried out, and when the tests have been successfully completed, they shall provide to the Contract Administrator signed certificates of tests, records and reports, in a form to be agreed.

In cases where the overall Contract programme is such that the Principal Contractor will need to return, for the purpose of testing, regulation, adjustment, etc., to portions of the buildings which by that time may be in occupation of the School, the Principal Contractor shall allow in their tender accordingly, and shall take all necessary precautions against damage when working in such areas.

If the Principal Contractor fails to remedy such faults or defects within a reasonable time period, the School may proceed to do so at the risk and expense of the Principal Contractor, and without prejudice to such other rights under the Contract.

Unless otherwise stated, electricity required for setting to work, commissioning, testing and operations running of the installation or any portion, therefore, will be provided free of charge to the Principal Contractor.

## **2.20 INSPECTION BEFORE CONCEALMENT**

Whenever work requiring inspection or testing is subsequently to be concealed, due notice shall be given to the Contract Administrator and Building Services Consultant so that inspection may be made, tests witnessed, or measurements taken before concealment.

Failure to give due notice may necessitate the Principal Contractor's uncovering the work and reinstating it at their own expense.

## **2.21 INSPECTION REQUIRED**

Inspection, testing, commissioning and operation of equipment and installations shall be made by the Principal Contractor, to demonstrate that it will perform as designed, conforms to the intent of the drawings and specifications, has proper insulation and safety features, and is not hazardous to personnel.

All systems, equipment and apparatus shall be of good workmanship and be free of dust, debris, moisture, oil, chemicals or other harmful matter.

## Electrical Systems

In addition to the tests and inspections called for in Clause 2.26 above, the following checks and tests shall be carried out:

Conduits, cables and accessories shall be firmly mounted or attached to their supports. Conduit connections shall be tightly done up.

Control panels shall be inspected for identification of circuits therein, fuse size or overload protective device setting, tightness of connections, firmness of mounting, cleanliness, mechanical damage and plugging of open conduit/cable entry holes.

Covers on BS boxes, adaptable boxes and trunking shall all be tightly secured in place. Lighting fittings shall be properly mounted.

Expansion fittings shall be installed where necessary.

Motors shall be checked for proper rotation and speed.

Controls shall be checked for proper operation of equipment and circuitry involved. Check inset nameplates for proper identification of components etc.

Discrepancies are to be corrected.

Check for mechanical damage, missing covers, loose or missing parts, cleanliness of relays, meters, and like equipment, and that doors and door locks fit properly.

Indicating lamps shall be checked for function and colour.

Voltage transformers shall have the fuses removed and checked for proper size and connection. Check that all connections and mounting bolts are tight.

All relays and protective devices shall be primary injection tested to check correct operation and calibration.

Relays of the overcurrent and undervoltage type shall be tested and adjusted according to the manufacturer's instructions.

The setting of overload elements in motor circuits should be checked against the nameplate currents of the motors.

Circuit breakers and fuses should be checked for discrimination and proper cable protection.

Meter selector switches shall be checked to determine that the phase indicated is the phase being read.

Interlocks are to be checked electrically and mechanically for sequence operation and functional operation and that all parts operate freely without binding.

Check electrical devices and cable connections.

Check electrical devices and cable connections and mounting screws.

Circuit actuating devices such as pressure switches, etc., shall be tested to simulate operating conditions wherever possible.

Where manual operation is not possible, leads shall be 'talked-out' to determine proper circuitry and continuity.

Thermocouple leads shall be 'talked/rung out' checked for proper connection and identification.

All gauges and sensors shall be check calibrated.

### Electrical Tests

The following tests shall be carried out by the Principal Contractor as detailed in the IEE Wiring Regulations.

The Principal Contractor's attention is drawn to the fact that additional tests will be required to ensure compliance with IEE Wiring Regulations, and due notice must be taken in respect to the sequence of testing.

Insulation tests in medium, low and extra low voltage cables, switch and distribution gear, all connected equipment, accessories and fittings.

The insulation tested shall be 1,000V type for medium voltage services, and 500V type for the low and extra low voltage services.

Continuity test on all cables, wiring circuits, metal sheaths, armouring, metallic bonding, conduits and trunking installations.

Continuity tests on concealed work shall be carried out as the work progresses and before final covering.

Polarity tests on all cables, wiring circuits to ensure all switches, control devices, etc., are connected to the live or line conductors.

Phasing tests on all cables and connections to ensure that standard colours and phases



are correct throughout the installation.

Line/Earth Impedance tests on all connected circuits, the loop impedance, and the maximum permissible fuse, rating or circuit breaker setting shall also be recorded.

Full Load Tests shall be carried out for a period of one hour and Voltmeter and ammeter readings shall be recorded for all phases.

The output of all communication systems shall be balanced to ensure even distribution.

**NOTE: The introduction of static switching and other electronic components into the control circuits make it advisable not to apply 1,000/500V insulation tests to these circuits.**

**1,000/500V insulation tests shall therefore apply to main voltage circuits only.**

**On other systems the complete circuit should be tested at the maximum voltage recommended by the manufacturer and standards.**

#### Specialist Equipment Test

Where testing and commissioning involves load and heat run tests on cables and electrical equipment or components of mechanical plant, the Principal Contractor shall be responsible for carrying out these tests and obtaining the necessary readings and data to the satisfaction of the Contract Administrator unless specified to the contrary.

Where electrical equipment or plant is specified to be tested by a Specialist Trader or such equipment has not been ordered through the Principal Contractor, then the Principal Contractor shall provide attendance, having first previously carried out the formal acceptance tests on all the associated electrical circuits and equipment installed under his Contract.

#### Audibility/Noise Control Tests

The audibility of fire alarm/warning systems shall be tested to ensure compliance with all relevant requirements.

The testing of noise control installations shall be inspected, tested and commissioned to prove that the design conditions have been satisfied.

These tests shall be to the satisfaction of the Contract Administrator or his nominated Noise Control Consultant, who will require the design performance to be proved.

## **2.22 TESTING IN SECTIONS**

The Principal Contractor shall allow for testing and commissioning the installation in sections as may be required in order to conform to the programme.

## **2.23 TESTING INSTRUMENTS AND SENSORS**

All indicating instruments, recorders, thermometers, pressure gauges, monitors and sensors shall be checked calibrated before commissioning commences.

These checks shall be made regardless of whether the components have been tested at works. All equipment used for check calibration shall be complete with a test certificate, issued within the last three months, to confirm that the equipment is accurate.

## **2.24 WITNESS TESTS AND INSPECTIONS**

The Principal Contractor shall take due note that where witness tests or inspections are called for the Principal Contractor shall have first carried out all his own tests and inspections in accordance with this specification.

Where necessary the Principal Contractor shall carry out remedial works, connections and modifications to rectify any defects or faults.

These shall be completed before the Contract Administrator is called upon to make witness tests and inspections.

## **2.25 COMMISSIONING**

All the electrical contract works shall be commissioned in accordance with the CIBSE Commissioning Codes and IEE Regulations 18th Edition.

The Principal Contractor shall ensure that all necessary test stations and equipment shall be installed to enable full compliance.

The Principal Contractor shall include for nominated specialists to commission all items of control equipment and associated accessories.

The complete control installation shall be tested and commissioned under full working conditions.

All plant shall be tested to ensure that it is operating in accordance with the specified conditions, and also that it is functioning in accordance with the control and interlocking sequence specified.

On completion of all commissioning of controls and plant, the Principal Contractor shall demonstrate in the presence of the Contract Administrator the correct working of the controls and plant.

The Principal Contractor shall give seven (7) days written notice to the Contract Administrator of the intention to demonstrate the controls and plant.

The Principal Contractor shall flush through, filter and clean all pipework for hydraulic systems prior to first operation.

The flushing hydraulic shall be replaced with a first fill of operational fluid which shall be sampled as directed by the Contract Administrator and sent for independent laboratory analyses.

The Principal Contractor shall carry out all such work and repeat the exercise until the systems are proved free of all debris and contamination.

The costs shall be borne by the Principal Contractor.

## **2.26 TEST CERTIFICATES**

The Principal Contractor shall present copies of test certificates within the Operating and Maintenance Manuals.

## **2.27 TESTS AT END OF MAINTENANCE PERIOD**

At the end of the defect's liability period, the Principal Contractor shall again fully test the installation, if called upon to do so, and shall make good any defects that have developed since the completion date.

## **2.28 OPERATING AND MAINTENANCE MANUALS**

Operating and maintenance manuals shall be prepared, as detailed in this specification, and be complete prior to hand-over and completion.

The operating and maintenance manuals shall include:

1. Index
2. Full description of the design
3. Illustrations describing operation routine, together with line diagrams showing the location and function of controls
4. Copies of all test certificates and commissioning records

5. Maintenance routines and details of where replacements may be obtained including a complete list of consumable items
6. Manufacturer's details of all equipment with maintenance and operating instructions and schedules of recommended spares
7. Emergency measures and helpful telephone numbers
8. A copy of each 'As-Installed' drawing

Where necessary the operating and maintenance manual shall be split into separate sections on a system-by-system basis as may be appropriate for ease of handling, reference and use.

The Principal Contractor will undertake the following operations in compiling an Operating and Maintenance Manual:

- Folding the folding will be such that easy reference can be made without removing any drawing from the manual - the title block being to the right-hand side
- Indexing the reader can locate any item of equipment in an efficient manner
- Collating each item of equipment with its attendant operating manual, drawings, data sheets, test certificates, etc into the appropriate section and volume
- Punching minimum of four holes to suit the binders of the covers
- Trimming any odd sized sheet to fit the engineering manual
- Reinforcing the insertion edge of drawings to ensure durability
- Binding in plastic binder suitably embossed.

The Principal Contractor shall supply covers to the Contract Administrator's approval and will undertake the printing and embossing for such covers to meet the Contract Administrator's requirements.

Two (2) hard copies and one (1) electronic copy of the approved operating and maintenance manuals are to be handed to the School or their representative prior to Practical Completion.

The Principal Contractor should note that Practical Completion will not be achieved unless the approved operating and maintenance manuals are in the possession of the School and

that a detailed system instruction/demonstration has been given to the School.

## **2.29 FRAMED DRAWINGS**

A valve chart detailing the system schematic and the valves, referenced against valve tags, will be required.

This drawing, as approved by the Contract Administrator, shall be permanent (not subject to fading) mounted in plastic glassed frames of approved designs and fixed to the wall.

## **2.30 MAINTENANCE GUARANTEE**

The Principal Contractor shall guarantee the whole of the works against failure due to faulty materials and/or workmanship for a period of twelve months from the date of Practical Completion or from the date of the final test and acceptance by the Contract Administrator, whichever is the later.

The Principal Contractor shall guarantee immediately to make good and repair or replace any defects, imperfections or deficiencies which may appear in any part of the works due to faulty materials, design or negligence on the part of the Principal Contractor or their employees during the progress of the Contract Works or during the tests upon completion.

The same guarantee shall remain in operation for the whole duration of the Defects Liability Period, following the completion and handing over of the Contract Works.

The Principal Contractor must give reasonable notice of the precise dates for access to the various parts of the works for the purposes of making good defects.

The Principal Contractor shall be responsible for the full routine and preventive maintenance during the defects Liability Period.

This period shall be deemed to be twelve (12) months from full acceptance of the installation.

The Principal Contractor shall allow for full servicing of all the new plant at the end of the Defects Liability Period.

## **PART THREE**

### **CODES, STANDARDS AND ADVISORY NOTICES**

#### **3.1 STANDARDS AND CODES OF PRACTICE**

All work and materials shall be carried out in accordance with the requirements of and meet the following:

- British Standards
- British Standards Codes of Practice
- Health and Safety at Work Act
- Building Regulations
- Gas Safety Regulations
- Water Regulations
- Electricity at Work Act
- Asbestos Regulations
- Construction (Design and Management) Regulations
- County Council Specifications for Mechanical and Electrical Services (where applicable)
- The Environmental Protection Act
- The Health Act
- The Equality Act
- The Management of Health and Safety at Work Regulations
- The Workplace (Health, Safety & Welfare) Regulations
- The Provision and Use of Work Equipment Regulations
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)
- The Confined Spaces Regulations
- The Working at Height Regulations
- The Manual Handling Operations Regulations
- The Personal Protective Equipment Regulations
- The Noise at Work Regulations
- The Control of Vibration at Work Regulations
- The Regulatory Reform (Fire Safety) Order
- The Lifting Operations & Lifting Equipment Regulations
- The First Aid at Work Regulations
- Department of Transport Specifications
- IEE Wiring Regulations - 18th Edition (BS7671)
- The Control of Substances Hazardous to Health Regulations (COSHH)
- Safety Rules & Procedures for Hot Work
- All related British Standard specifications and British Standard Codes of Practice
- The Chartered Institute of Building Services Guide including the Commissioning Codes, Technical Memoranda, Practice and Energy notes
- Building Control and Fire Officer requirements
- BSRIA documentation and commissioning codes
- O&M documentation in accordance with the BSRIA Guide BG1/2007 to Classification D
- The Electricity Safety, Quality and Continuity Regulations
- The Electromagnetic Compatibility Regulations

- National Inspection Council for Electrical Installation Contractors Standards
- CIBSE Commissioning Code M
- CIBSE Guid C – Reference Data
- BS9999 Code of Practice for Fire Safety in the design, management and use of buildings

### Statutory Authorities and Regulations

The Principal Contractor shall make full allowance for complying with the requirements of the Building (Safety, Health and Welfare) Regulations and any other Regulations under the Factories Act and Regulations of the Department of Employment and agreements between Trade Unions and the Trade Associations.

Special mention is made to the Health and Safety at Work Act which must be observed at all times.

The Principal Contractor is required to give all requisite notices to local and other Authorities, and statutory undertakings, deposit plans, obtain all licences, allow for and pay any fees legally demandable.

The Works are to be executed in accordance with the Byelaws and other regulations, as necessary.

All electric wiring, plant and equipment, the methods of installation and connection shall satisfy the requirements prescribed by the Board of Trade, Home Office and Local Authority having jurisdiction thereon and be in accordance with the Current Edition of the Rules and Regulations for the Electrical Equipment of Buildings as issued by the Institute of Electrical Engineers and with the appropriate Regulations of the Factories Acts, those issued by the Electricity Commissioners, and the Electricity at Work Act.

## **3.2 ADVISORY NOTICES**

### Regulations for Electrical Installations (18th Edition - BS7671)

The need for planned methods of design, wiring and installation work has long been recognised and all kinds of regulation, requirements, recommendations, codes of practice and so on, have been issued.

Some of these are mandatory and can be enforced by law, whilst others are merely recommendations.

Reference must be made to all the appropriate rules and regulations, copies of which must be obtained and studied.

It will be seen that everyone intends to undertake any electrical installation must be conversant with all the recognised standards and practices.

The IEE Wiring Regulations are the recognised standards by which all electrical installations work is judged in the country, and the Principal Contractor/Designer shall be responsible for the full compliance with the 18th Edition in every respect throughout the whole of the works.

The Principal Contractor's attention is drawn to the following when carrying out the works:

AN INSTALLATION COMPLYING WITH THE 18th EDITION IS ONE WHICH:

1. Is suitable for its intended use
2. Has a supply adequate for its assessed maximum demand
3. Comprises equipment suitable for the external influences to which it will be subjected
4. Comprises equipment correctly selected as regards compatibility and maintainability
5. Embodies protective measures for safety which remain effective over its intended life
6. Is designed so as to facilitate safe operation
7. Is designed so as to avoid danger and minimize inconvenience in the event of a fault
8. Has been erected using good workmanship and proper materials
9. Is designed so that periodic inspection, testing, maintenance and repairs can be readily and safely carried out, when necessary
10. Has been inspected, tested and certified as complying with the 18<sup>th</sup> Edition

Health and Safety At Work

The requirements of the 'Health and Safety at Work etc Act 1974' and subsequent amendments thereto are brought to the attention of all those who design, install, operate or maintain the plant and equipment required by the specification and/or drawings or who are required to enter the areas covered by the specification or depicted on any such drawings.

The Principal Contractor shall be responsible for ensuring that all items of plant, machinery and systems comply with the legislation mentioned above, that the manufacturers comply and that all necessary manufacturer's instructions are included in the operating and maintenance manuals and, where necessary, fixed to the items of plant as well.



The Principal Contractor shall be responsible for providing all plant rooms and plant with the necessary notices, workings and/or instructions.

These shall cover maintenance, working, operating and access to, egress thereto or therefrom. For example, all plant rooms shall have a notice permanently secured to all doors stating

**'NO ADMITTANCE TO UNAUTHORISED PERSONNEL'**

in letters 50mm high followed by:

**'HEALTH AND SAFETY AT WORK ACT 1974  
PERSONS ENTERING THESE PREMISES MUST COMPLY WITH  
ALL SAFETY REGULATIONS UNDER THE ABOVE ACT'**

All plant rooms where the noise level is in excess of 80dBA shall have a warning notice on all doors in accordance with the Code of Practice for reducing the exposure of employed persons to noise.

All plant rooms containing combustible substances - for example, gas, oil, petroleum or refrigerant, etc., shall have **'NO SMOKING'** notices on the doors together with the combustible substance identified.

### **3.3 PRINCIPAL CONTRACTOR'S REGULATIONS**

#### **Right of Entry**

The School reserves the right absolutely to:

- a) Refuse admission to the premises and its environs, to a Principal Contractor, Principal Contractor's employee or his representative whether or not that person has previously been admitted to the premises
- b) Require such a person to leave the premises

#### **Identification**

All Contractors attending the School will be required to give their name, trade or profession and organisation.

Contractors and their employees will be issued with a Contractor's pass, which must be displayed at all times when on School premises.

### Fire Precautions

Due to the nature of the premises and the serious consequences of any fire, no work involving the use of naked flame, e.g. welding, or work which may produce sparks, including metal cutting or grinding is permitted without the School's and Contract Administrator's approval of written method statements.

Contractors required to undertake such work must ensure adequate fire-fighting equipment is present, and ensure adequate screens are provided for the protection of personnel and the general public.

Smoking is strictly prohibited on the site and any Contractors refusing to comply with this requirement will be asked to leave the School and not return at any time.

### Searching

The School reserves the right to search all bags and vehicles leaving the premises.

### Use of School Equipment

Contractors will not be permitted to use any School equipment, plant or other facilities without the express authority of the School, and by prior arrangement.

Contractors will be required to provide all plant and equipment necessary to carry out the work in hand, and ensure current Health and Safety Requirements are complied with in full.

### Association

The Principal Contractor's personnel shall not be permitted to associate with any pupil.

## **PART FOUR**

### **MECHANICAL SERVICES INSTALLATION**

#### **4.1 GENERAL**

The building existing low temperature hot water (LTHW) heating affected by this project is provided from one (1) plantroom as detailed within our tender documentation.

#### **4.2 REMOVAL OF EXISTING SERVICES**

The Mechanical (Principal) Contractor shall allow to isolate, drain down, make safe, disconnect, and remove/re-configure the existing mechanical services as detailed on our tender drawings and as far as practically possible.

This generally includes the following:

1. Two (2) Strebel model RUIS-4 floor standing natural gas fired conventional heating boilers
2. F&E tank and associated pipework
3. Complete boiler flue installation (by specialists Chimney & Canopy Systems Limited)
4. Complete controls installation (by specialists Control Panel Services Limited)
5. Complete low temperature hot water installation, in the plantroom, including boiler shunt circuit, variable temperature circuit, constant temperature circuit; including all circulating pumps, valves, gauges, etc.  
Note: The pipework installation is to be stripped back to the exit from the below floor trench Pipework in the below floor trench is to be left drained down but in-situ
6. Natural gas and mains cold water installation in the plantroom to the locations as detailed on our tender drawings
7. LTHW distribution pipework and heating emitters as detailed on our tender drawings

The Mechanical (Principal) Contractor can arrange to visit site via the RAM Building Consultancy contact detailed earlier in this specification.

Please see link to survey photographs to assist tendering –  
<https://app.box.com/s/au4iqhfcbyta2ataleooc0nnvnt11fu1>

#### **4.3 LOW TEMPERATURE HOT WATER HEATING INSTALLATION**

The Mechanical (Principal) Contractor shall allow to provide and install a new low temperature hot water heating arrangement in the plantroom as detailed on our tender drawings.

This generally includes the following:

1. Two (2) Remeha model Gas-220-Ace-160 - Product Code: 7663312-01(x2) floor standing natural gas fired condensing boilers including combustion air filters and commissioning

Contact: John Cartledge

Telephone: 07850 618657 – e-Mail: [John.Cartledge@baxiheating.co.uk](mailto:John.Cartledge@baxiheating.co.uk)

Order Contact

Telephone: 0345 070 1055 – e-Mail: [commercial.sales@baxi.co.uk](mailto:commercial.sales@baxi.co.uk)

Quotation Number: BHQ-1139707 (dated 27.01.2022)

2. Low temperature hot water (LTHW) replacement boiler shunt circuit and variable temperature circuit; including circulating pumps, valves, gauges, temperature detectors, water treatment plant, and low loss mixing header

Note: Control valves/actuators and temperature detectors are to be supplied free-issue to the Mechanical (Principal) Contractor to install in the new arrangement

3. Replacement boiler flue installation by specialists Chimney and Canopy Systems

Limited 1 Jeddo Street

Wolverhampton

West Midlands WV2 4EN

Contact: Craig Phillips

Telephone: 01902 393900 – e-Mail:

[craig@chimneycanopy.co.uk](mailto:craig@chimneycanopy.co.uk) Quotation Reference:

CDP/SE/10468

The flue specialists works are to include the following works (to be costed separately as per the pricing schedule):

i) Removal of existing flue installation in the plantroom, tank room and externally

ii) Provision of new flue installation

iii) Removal of remaining complete flue installation outside of the plantroom

4. Pressurisation arrangement comprising a Mikrofill Limited model pressurisation unit, one (1) 400L expansion vessel and cold feed arrangement.

5. 25mm thick thermal insulation with “Isogenopak” clad finish and valve bags (for all new valves); on all new distribution pipework in the plantroom and identification banding in accordance with BS1710

6. Reconfiguration of the existing natural gas steel distribution in the plantroom including a 100mm gas solenoid, isolating valves and test points

All works are to be carried out strictly in accordance with the Gas Safety Regulations  
Complete existing/new pipework in the plantroom is to be painted “Yellow Ochre”

7. New LTHW heating distribution and heat emitters as detailed on our tender drawings

#### **4.4 CONTROLS SPECIALISTS WORKS**

The Mechanical (Principal) Contractor shall allow to employ controls specialists to provide and install a control panel and controls arrangement in the plantroom as detailed on our tender drawings.

All works shall be designed, supplied and installed by:

Control Panel Services Limited  
Unit C3 Blaby Business Park  
Rose  
Way  
Blaby  
Leicester LE8 4DP  
Telephone: 0116 261 2740 / 07493 800449  
Email:  
[dave.holland@cpscontrols.com](mailto:dave.holland@cpscontrols.com) or  
[martin.norman@cpscontrols.com](mailto:martin.norman@cpscontrols.com)  
Quotation Reference: CPS-22022

The control specialists shall also carry out electrical works as shown on our tender drawings including strip-out works, galvanised steel trunking and conduit arrangement and local isolators.

The Principal Contractor shall provide all necessary automatic controlling devices whether field or panel mounted, together with all control and electrical wiring for the complete functional installation.

The automatic controls shall be commissioned by Control Panel Services Limited and a controls demonstration is to be carried out on completion.

#### **4.5 PIPEWORK INSTALLATION**

All low temperature hot water heating pipework is to be installed in mild steel tube to BS1387 with screwed and socketed fittings.

All mains cold water services pipework shall be run in copper tube to BSEN 1057:2006 with capillary or compression fittings.

Valves, automatic and manual vents and drain points shall be located in accessible locations.

#### **4.6 CHLORINATION AND WATER TREATMENT**

The heating system shall be flushed and treated in accordance with Series W CIBSE Commissioning Code and in accordance with the requirements noted in section 3.1.

Corrosion inhibitors shall be as supplied by Fernox Manufacturing Company Limited or equivalent to suit the equipment and mixture of metals used on the heating.

#### **4.7 THERMAL INSULATION**

All heating and domestic water services shall be thermally insulated using foil backed rigid glass silk sectional insulation.

Final insulation is to be white "Isogenopak" clad finish.  
Valve bags are to be provided on all new valves in the plantroom.

Identification banding is to be fully in accordance with the requirements of BS1710.

#### **4.8 TESTING AND COMMISSIONING**

The Mechanical (Principal) Contractor shall carry out testing and commissioning of all services in accordance with BS6700; BS5449 and CIBSE Code W; and issue certificates for the following:

1. Low temperature hot water heating balancing
2. Heating chemical dosing certificate
3. Boiler commissioning
4. Controls commissioning
5. Electrical test certification
6. Gas safety certificate
7. Pressure test certificates
8. Water treatment commissioning
9. Emergency lighting certification

#### **4.9 DEMONSTRATION TO THE EMPLOYER**

In addition to the Operating and Maintenance Manual, the Mechanical (Principal) Contractor shall allow to provide simple to follow written instructions for the Employer's Representative.

The Mechanical (Principal) Contractor shall also demonstrate the operation of the new systems. A signed 'Acceptance' form (signed by the School) shall be included in the Operating and Maintenance Manual.

## **PART FIVE**

### **ELECTRICAL SERVICES GENERAL REQUIREMENTS**

#### **5.1 INTRODUCTION**

This section of sets out the general standards of workmanship to be maintained in this Contract.

The mention of any specific materials, plant or procedure does not necessarily imply that such is to be included in the works.

This section of sets out the general standards of workmanship to be maintained in this Contract and shall be read in conjunction with all sections of this specification.

Only fully skilled operatives shall be employed to carry out the works.

The use of apprentices is encouraged but all apprentices shall be under full supervision at all times whilst on site.

#### **5.2 LSF INSULATED STEEL WIRE ARMoured XLPE SHEATHED CABLES (XLPE/SWA/LSF) COPPER CONDUCTORS**

Where LSF SWA cables are specified, they shall be to the working pressure indicated on schedules and/or drawings with LSF insulated cores, XLPE sheathed, steel wire armoured. Each coil shall comply fully with the requirements of BS6346.

Any bend in a cable shall have an inside radius not less than that recommended by the manufacturer of the cable.

No through joints will be allowed in any cable.

All such cables shall be terminated with mechanical glands which shall be of the type as to provide adequate mechanical support by positively locking the armour and shall, at the same time, give a high level of earth continuity.

Each gland shall also make a water-tight seal on the inner and outer cable sheaths. The glands should be finally protected with LSF shrouds.

#### **5.3 MINERAL INSULATED COPPER SHEATHED CABLES (MICV)**

All mineral insulated copper sheathed cables, seals, glands, saddles and accessories are to be of one manufacturer and the Principal Contractor shall allow for supplying and fixing all necessary seals, tails, sleeving and accessories.

Where so specified, the cable shall have an overall LSF sheath.

The whole of the installation is to be carried out with the tools recommended by, and in accordance with the instructions and recommendations of the manufacturer.

Only tradesmen skilled in the use of MICC cables shall be used on the installation, and the tradesmen on site shall demonstrate their ability by 'making-off' a trial seal or seals, at the request of the Engineer to his complete satisfaction.

The cables shall comply in all respects with the relevant British Standard. No through joints will be permitted in any cables without the sanction of the Engineer. Use of Cables  
Heavy duty cables are to be used for mains, sub-mains and all cables with conductors over 1.5mm<sup>2</sup>.

Light duty cables are to be used for sub-circuit wiring with conductors up to, and including, 1.5mm<sup>2</sup>.

### Cable Runs

Where cables enter boxes and equipment, the following methods of termination shall be adopted:

- a) Universal ring-type glands shall be used as standard in all situations, other than those detailed, and at no time will any other type of gland be used for sub-main cables.

Where entry to the equipment or box is already tapped, the gland shall be screwed directly into the equipment, utilizing, where necessary, solid brass reducing sockets.

The minimum size of entry permitted is 20mm ET.

When an entry is made by a clearance hole, the gland shall be secured with a solid brass locknut.

Brass stopping plugs shall be fitted to all spare entries in equipment or boxes.

- b) Where boxes with special MICV clamps are specified for accessories, the use of a screw-on type pot seal may be adopted. By this method the seal is clamped, and no gland is required.

### Seals

Generally, all cable ends shall be sealed with cold screw-on pot type seals of the appropriate size, and utilizing cold plastic compound.



Where the above seals are used without glands, the seal shall be fitted with a permanently fixed flexible earth tail.

The earth tail shall be connected to an earth terminal inside the accessory or equipment. In certain cases, it is necessary to use a larger seal when an earth tail is required.

All seals should be tested not less than 24 hours after completion.

The test must be made with insulation testing equipment of the Insulation Resistance type, at a pressure of 500V or 1000V, and a reading of infinity must be obtained before conductors are connected.

When MICV cables are cut, all open ends (including those on coils) shall be temporarily sealed with suitable compound to prevent the ingress of moisture.

The Principal Contractor shall, at the request of the Building Services Engineer, subject any length of installed cable to a quality test consisting of applying a 1,000V Insulation Resistance test to the length of cable when both ends have had the seals affixed.

The test between conductors and the sheath shall be infinity.

All joints shall be made at main switches, distribution boards, switches, ceiling rose boxes, socket outlet boxes and fixed appliances.

### Tails

The cable tails shall normally be insulated with black neoprene sleeving and extension sleeving, where necessary, for long tails.

But, where necessary, in hot situations, the sleeving shall be silicon rubber.

Hot situations shall be defined as connections to tungsten fittings and connections to, and in the vicinity of, heating apparatus which directing and mechanically is coupled to the heating system.

For the purpose of core phase identification, coloured LSF sleeves, or coloured LSF extension sleeves, shall be used on the core sizes for which they are intended. Coloured adhesive tape shall not be used for this purpose.

With cables having conductors of  $1.5\text{mm}^2$ , and smaller, the conductor shall be bent back upon itself where it connects to equipment in order to present a fair face to any pinching screw or clamp.

All cables are to be run neatly and unobtrusively, and are to be straightened by means of the special tools available for this purpose.

On multiple cable runs, care shall be taken to avoid the necessity of crossing cables over each other.

### Bending and Fixing

Cables are to be fixed in the various locations as follows:

- a) On the surface of unplastered wall and ceiling and in damp situations:  
Heavy gauge one-hole fixing spacing saddles and spacing type 'P' clips
- b) On finished surfaces (where permitted):  
Heavy gauge copper saddles
- c) Concealed cables:  
Standard Copper clips and saddles.

Where necessary, and with the approval of the Building Services Engineer, the Principal Contractor may, in concealed situations, use straps and saddles made of special design for the appropriate purpose, made of heavy gauge copper strip.

All saddles, clips and straps shall be secured with brass wood screws, countersunk for one-hole fixing saddles and round-head for all other situations.

The spacing and fixings shall be as follows:

All concealed works	1000mm
On surface work	250mm

No bend in the cable shall have an inside radius of less than six (6) times the outside diameter of the cable.

Where cables are flushed into acid plasters, or are in atmospheres of a corrosive nature, they are to be LSF sheathed or served with LSF tape.

Glands are to be fitted with LSF protective shrouds.

The type of plaster to be used must be ascertained on site, as in most cases the decision is not made until the plastering Contractor is negotiated.

For tendering purposes, the plaster is assumed to be neutral unless specified otherwise.

Cables are to be prevented from contact with gas or water pipes by LSF sheathing or

served with LSF tape.

Incomplete terminations, due to building construction work, must not be supported solely by the cable - any coiled ends, etc., being firmly supported from a temporary fixing.

Incomplete seals or cut ends of cables must be sealed by a liberal application of cold sealing compound, held in place by self-adhesive LSF tape.

#### Sub-Circuits

Spare ways left for possible future extension are to be fitted with brass topping plugs, where possible, link boxes are to be provided at each end of underground runs so that the cable can be completely disconnected from the rest of the installation.

The boxes are to comprise malleable cast iron adaptable boxes, with porcelain connectors, and with machined weatherproof heavy covers and faces.

#### Testing

Where cables are laid in screed, they shall be tested shortly after the concrete is poured (ie while the concrete is still 'green').

Where cables are run behind 'pinned' ceilings, tests must be carried out immediately after the ceilings are fixed and before decoration commences.

In all cases, the tests shall give an infinity reading between cores and between cores and sheath.

### **5.4 CABLING METHODS**

All cables shall be either clipped to walls, ceilings and building structures, or run in ducts and trenches provided by the Principal Contractor.

All cable hangers, cleats, saddles, brackets or similar supporting devices, shall be of an approved type and of adequate strength for the cables they are supporting - non-ferrous, and so treated to withstand site conditions without corroding.

Every cable, whether in or out of sight, shall be neatly run vertically, horizontally or parallel to adjacent walls, beams or other structural members.

Spacing of clips, saddles and cleats, shall be such to prevent sagging of the cables at all times during their installed life.

Cables run in indoor trenches or external pre-formed ducts, shall be segregated and, as standard, laid in the bottom of the trench or duct.

But where specified in the specification and/or drawings, they shall be run on cable trays or brackets, secured to the trench wall.

Where a number of cables are terminated to any particular item of equipment, then special care shall be taken to ensure that they finally approach the equipment from a common direction and are individually terminated in an orderly and symmetrical pattern.

Cable trays shall be of perforated mild steel, galvanised after manufacture, or nylon sheathed mild steel and, in some cases, completely rigid PVC trays.

Where sheathed trays are cut and shaped on site, all cut edges and non-sheathed supporting brackets shall be painted with at least two coats of polyurethane based paint.

Cables run on trays shall not be double tiered, or arranged in any way to impede the removal of any single cable after installation.

All holes for fixing clips, racks, trays, cleats etc., to the building structure shall be made in the approved manner.

When cables are buried in the earth, the bottom of the excavated trenches shall be free from sharp stones, etc., and the bottom covered with sand or fine sifted soil to a depth of 50mm.

All such cables shall be unrolled from the drum in such a manner as to avoid loops and kinks, and care shall be taken when laying, to avoid damage to the outer sheath by drawing over sharp objects, stones etc.

Cables shall be gently snaked in the trenches to avoid tension in the cables during the back-filling and from subsequent settlement.

After laying, the cables shall be covered to a minimum depth of 75mm by sand or sifted soil, and over-laid with protective interlocking earthenware or concrete tiles or, in some instances, with a yellow heavy gauge polythene tape suitably inscribed as to the service it is protecting, laid 225mm below the surface level directly above the cable.

Concrete marker posts shall be provided at 10m intervals, each fitted with a suitably inscribed cast or enamel metal plate, showing the voltage of the cable whose position it marks.

Similar plates are to be provided and fitted to the outer walls of the buildings at points of entry. Marker posts shall also identify the position of any joints in the cable run.

Wherever it is necessary to remove the LSF sheath of a cable, eg at a joint, the minimum length necessary shall be removed and the exposed armour of copper conductor shall be neatly protected by LSF tape or sleeves, All cables shall be delivered to site on robust cable drums, with cable ends treated with an effective seal.

When cable is cut from a drum, the cable end and the end left on the drum shall immediately be sealed to prevent the ingress of moisture.

Each and every cable shall be permanently identified at each end by its designation or number, as required by the Engineer.

The cables shall be marked by cable marker tabs, neatly and securely fastened at either end of the cable by means of LSF strip and studs.

Cable markers shall also be installed at entry and exit points of buried ducts, exits from buildings, and in such other positions the Engineer considers it necessary to identify and trace the route of any cable.

In addition, all control cables shall have individual cores identified by means of suitable permanent ferrules.

Core identification shall occur at every point of termination with ferrules bearing the number of the terminals to which the core is connected.

Should there be any joint in control cables, they shall be made in a wall-mounted junction box and with cores ferruled and identified in accordance with the schematic or distribution drawings.

## **5.5 UNIFORMITY OF CABLES**

All cables shall be so connected between main switchboards, distribution boards, plant and accessories, so that the correct sequence of phase colours are preserved throughout the system.

All cables cores shall be identified with phase colours for three and four-wire circuits, and red and black for single phase circuits.

Where more than one Phase is incorporated on a common system in one room, the live cores shall be red, yellow and blue as appropriate, and fittings and switch accessories shall be permanently labelled and segregated in accordance with the Institution of Electrical Engineers' Regulations.

Where a number of cables are terminated to any particular item of equipment, then special care shall be taken to ensure that the cables finally approach the equipment from a common direction and are individually terminated in an orderly and symmetrical fashion.

## **5.6 DISTRIBUTION BOARDS**

Distribution boards shall be sheet steel construction, of adequate thickness, suitably braced to form a rigid structure.

Exterior corners and edges shall be rounded to give a smooth overall appearance. Doors shall be fitted with gaskets and shall be removable to simplify installation.

Each distribution board shall be arranged for top and bottom cable entry and shall be provided with an ample cable termination plate and chamber to enable cables to be neatly terminated with tails grouped and terminated on the appropriate internal terminals.

Distribution boards shall, when specified, incorporate on load isolators, which shall be front panel operated with ON/OFF indicators and capable of being padlocked in the OFF position. Distribution boards shall incorporate a combination of single pole and neutral and tripe pole RCBO's or MCB's, as specified.

Blanking plates are to be used for all future or spare circuit ways, unless otherwise stated.

Each bank of MCCB's/MCB's/RCBO's shall be clearly identified with its appropriate phase colour/code and the mounting frame-work for the bank of MCCB's/MCB's/RCBO's shall be easily removable to simplify installation.

Adequate phase barriers and shields shall be fitted to ensure that after installation and wiring, all terminals and wires are covered to prevent accidental contact with live conductors during the normal procedure of fuse changing and resetting of MCCB's/MCB's/RCBO's.

Any trunking, channel, conduits etc., necessary to create a neat and tidy appearance at distribution positions, shall be included for and installed.

Any conductor entering or leaving the distribution board smaller than can be correctly terminated within the distribution boards, shall be bound with tinned copper wire to an appropriate cross-sectional area, and then sweated solid, or by the use of compression ferrules. Care must be taken to ensure that correct groupings on live and neutrals is observed ie., because MCCB/MCB/fuse no. 1 is on the extreme left-hand side of the distribution board, then the neutral for circuit no. 1 must enter the extreme left-hand side of the terminal block.

All distribution boards are to be secured to the building structure using appropriate size loose bolt type rawl bolt or an approved equal.

Each distribution board shall be complete with a permanent circuit identification chart, preferably mounted inside the front door.

This chart shall be permanently and legibly filled in as circuits are completed - the circuit description including the fuse rating.

It is most important that all circuits are connected to the exact circuit shown on the distribution drawings unless written agreement to any deviation is given by the Engineer. This will ensure that records on drawings are kept accurate.

Distribution boards are to be clearly labelled on the outside cover as to their function and designation, as detailed by the Engineer, by means of a laminated White-Black-White 'Traffolyte' label engraved to show black lettering 5mm high.

The labels shall be fixed with not less than four brass cheese-headed screws.

## 5.7 **STEEL CABLE TRUNKING AND DUCTING**

The trunking shall be constructed of substantial sheet metal, not less than 18swg, with welded joints, and shall be provided with removable cover, and the sizes and finish shall be as detailed in the preceding clauses.

All couplings, flanges, bends and tee pieces etc., shall be formed from fabricated units designed for the trunking specified.

Trunking, bends or sets must be of ample size and suitable design to allow for cable bends of not less than 2.5 times the outer diameter of the cable.

All sections of trunking must be securely bonded together and a suitable bonding link shall be fitted at all coupling bends and other fittings.

Where trunking is in contact with, or very near to, other metal work, this is also to be bonded, otherwise care should be taken to keep trunking away from any other metalwork.

Due allowance shall be made for expansion of long lengths of trunking in accordance with the manufacturer's instructions.

When trunking is used as an earth continuity conductor, the resistance shall not be more than twice that of the largest cable within the trunking.

The maximum number of cables installed in any trunking shall be such that a space factor of 45% is not exceeded.

Care must be taken to avoid abrasive edges within trunking or trunking joints, bends or outlets.

Where unprotected cables leave the trunking, suitable bushing shall be provided with Paxolin, or similar materials, drilled or slotted to accommodate the cable.

All trunking is to be generally protected against the ingress of water or dirt, and when

run underground or within floor finishes the trunking is to be waterproof.

Where conduits enter trunking, flanged conduit sockets shall be used to terminate the conduit into the trunking.

All joints shall be mechanically sound, electrically continuous and protected against corrosion.

Where trunking is run vertically, the cables shall be supported at not less than 2.3m intervals.

Where trunking is installed with the lid facing downwards, or when required by the Engineer, or runs with the lid on the side, cable retainers shall be fitted at centres not exceeding 1m.

These are to be of the type supplied by the manufacturer of the trunking.

Where trunking passes through floors, walls or ceilings, the holes shall be made good with a fire-resistant material and no orifice is to be left between trunking and the building structure. Also, internal fire-resistant barriers shall be provided to prevent the spread of fire.

Where cables of different services are run in the same trunking, a dividing metal fillet is to be incorporated for the segregation of the services where required by the current edition of the Institution of Electrical Engineers' Regulations.

## 5.8 **PLASTIC CABLE TRUNKING**

The trunking shall be constructed of high impact LSF, provided with a clip-on removable cover, and shall be of the sizes and types detailed in the preceding clauses.

All fittings and accessories shall be constructed by the manufacturer of high impact LSF and shall be designed for a plug-type friction fit or secured by plastic rivets.

For all straight runs, each length shall be provided with expansion joints to allow for thermal expansions.

Cable retainers shall be fitted in all trunkings at 1m centres.

Where trunking is suspended, a stirrup type support shall be used at 1m intervals. Should lighting fittings be directly suspended from the trunking, the fittings supports shall be arranged to coincide approximately with the trunking suspension.

In warm situations, or in direct sunlight, the trunking supports shall be at 1m centres.



The joints in the removable cover shall not coincide with the joints of the trunking.

Where trunking is fixed to walls and ceilings, it shall be fixed at 1m centres by means of round headed screws, suitable plugs, and large diameter steel washers to provide adequate support.

In all other respects, the installation of LSF trunking shall be carried out in a similar manner to that specified for steel trunking - See Clause 5.8.

## **5.9 HEAVY GAUGE SCREWED STEEL CONDUIT**

All conduits shall be new heavy gauge welded and screwed enamelled or galvanised, solid drawn as specified and made in conformity with the relevant British Standard and any subsequent amendment.

Each length of conduit shall bear a stamp guaranteeing it to be to this specification. The use of conduit less than 20mm will not be permitted.

The conduit system shall be such that all metal employed is securely and safely connected together by means of screwed connectors of low electrical resistance, so that the whole of the metal employed (apart from current carrying parts) is electrically and mechanically continuous throughout; and connected to earth.

The conduit throughout shall be of adequate section and arranged for drawing in or out of any or all of the cables in the conduit.

Corners shall be turned by easy bends of sets made cold without opening the joints or altering the section.

Solid-on-inspection tee pieces will not be allowed.

Great care shall be taken to ensure that all surface-run tubework is fixed as inconspicuously and symmetrically as possible.

All conduits, after cutting, shall be carefully reamed so as to remove all burrs and sharp edges. Enamel and oils shall be carefully removed from all parts screwed together.

All conduit fittings and accessories, including screwed couplers, ordinary clips, saddles, pipe hooks, screwed reducers, stopping plugs, locknuts and male and female bushes, shall be manufactured in conformity with BS31 where applicable.

All screwed couplers, screwed reducers and locknuts shall be made of malleable iron and all stopping plugs, male and female bushes made of brass.

Round locknuts shall only be permitted to be used on surface work.

All conduits and conduit boxes shall be securely fixed in position and all joints shall be coated with an approved acid proof paint after erection.

Where any finish of conduit is damaged in erection, it shall be made good in the same colour. Interiors of all spouts shall be left clean.

All conduits, conduit fittings and equipment shall be erected prior to any cables being drawn in. All open ends of conduits shall be blanked off with screwed brass plugs.

Plugs of waste, wood, paper etc., shall, under no circumstances, be used.

Where conduits are installed in a straight run, draw-in boxes shall be provided at no more than 10m intervals.

Where conduits are run from point to point with not more than two right-angle bends, boxes shall be provided at intervals of not more than 7.5m.

No ceiling looping-in boxes shall be used for more than three conduit terminations. Four-way boxes will not be accepted.

No ceiling looping-in boxes shall be used to accommodate any circuit wiring other than that for which the ceiling box was intended, and no circuit wiring shall pass through a fitting other than to which the fitting is connected.

Connections between conduits/boxes with clearance holes will be fitted with brass compression washers.

The whole then tightened down by means of hexagonal male brass brushes. Locknuts and female bushes will not be permitted anywhere.

All conduit shall be installed with at least 150mm clearance of any gas pipe, hot water or steam pipe or radiator and the Principal Contractor will be held responsible for ensuring that all pipe positions are agreed with the Engineer.

In situations where this clearance is not practicable, contact between conduit and other service pipes shall be prevented by means of insulating distance pieces.

Where the conduit is, or may be, in contact with any other pipe or metalwork, an efficient metallic connection shall be made between the conduit and the pipes or metalwork.

Conduit sets through walls will not be permitted.

When a change of direction is required after passing through a wall an appropriate back outlet box is to be fitted.

Where conduits cross expansion joints, special expansion sleeves or other appropriate methods should be employed.

Where two or more lines of conduit run parallel with each other on walls etc., the distances between them shall not be less than 25mm and where conduits cross, a space of 50mm shall be left at crossing.

All conduits must run vertically and horizontally.  
Diagonal runs will not be permitted on walls.

Female brass brushes shall be screwed onto all free ends of conduit.

All external conduit and surface conduit installed in damp, exposed and corrosive situations, shall be galvanised (including fittings).

Where passing from inside to outside of buildings, into and out of ducts, or elsewhere where severe temperature gradients may be existing, the conduit system of each section shall be isolated from each other by the insertion of conduit boxes wither side of the dividing wall, filled after wiring with cold sealing compound of a permanently plastic nature.

Where it is required to run conduit in wall cavities, floor ducts etc., only galvanised conduit shall be used.

Permission must first be obtained from the Engineer before these runs are installed. In these situations, box lids must be fitted with rubber gaskets and external boxes must be filled with cold plastic compound.

The 'U' shaped conduit runs shall be provided with a drain outlet for condensation. This shall consist of a 'solid tee', the bottom outlet being fitted with a brass stopping plug having a 15mm diameter drain hole.

All conduits, boxes and fittings which are to be buried in concrete, plaster etc., are to be thoroughly coated with red oxide paint before and after erection.

Where conduits are buried in wall chases, the chase shall have sufficient depth to ensure a minimum cover of 10mm of plaster.

Conduits run on the surface of walls of ceilings shall be fixed by heavy distance saddles fixed not more than 1200mm apart, and screwed by the means of countersunk screws and suitable plugs of the correct size.

Conduits in all other concealed positions shall be fixed by spacer bar saddles, fixed not more than 1200mm apart, and to the fabric of the building as specified in the above paragraph.

Sunk conduits shall be fixed by means of mild steel pipe hooks driven into dry hardwood plugs not more than 1200mm apart.

In in-situ ceilings the conduit and boxes shall be laid on the shuttering and held in place in an approved manner so that they are absolutely rigid while the concrete is poured.

Conduits laid on top of the roof or floor blocks to ceiling points etc., shall be fixed by means of corrugated steel saddles, fixed by a method approved by the Engineer.

Where conduits are installed in suspended ceilings they shall be supported by 25mm x 3mm MS strap, or a length of 5mm diameter MS rod threaded at each end with one end securely fixed to the building fabric and the other fixed to the conduit or conduit boxes.

The rod and strap shall be painted with bitumastic before and after erection.

In addition, at bends, sets and boxes the conduit shall be fixed by saddles on either side as applicable.

All boxes shall be securely fixed by not less than two countersunk screws, suitably spaced.

Any conduit or conduits incorrectly positioned or fixed not in accordance with these specifications and drawings must be corrected at the expense of the Principal Contractor.

Small standard circular malleable iron conduit boxes conforming to the relevant British Standard with heavy malleable cast iron lids and brass fixing screws shall be provided and fixed at all junctions and the necessary angles and bends of conduit. For surface work boxes of the raised back pattern shall be used.

The above circular boxes or equivalent 'looping in' boxes shall be provided and securely fixed for all ceiling points.

Where boxes finish behind surface level, the correct extension rings shall be fitted to finish level with surface.

Where the above circular boxes are flush with the ceiling or wall surfaces, approved break joint rings shall be provided, where necessary, to hide the joint.

Adaptable inspection boxes shall be of the malleable cast iron type and shall be provided and fixed at the inspection positions where more than two conduits cross. The use of sheet steel aluminium or zinc alloy boxes will not be permitted.

For surface work, the boxes shall be provided with malleable cast iron lids machined or ground to make good contact with the boxes secured by four brass round headed screws.

Where the boxes are fully recessed, they shall be provided with plastic overlapping lids, with an overhang of 6.5mm on all sides, which shall be secured in the same manner as the

malleable cast iron.

Boxes shall be fixed by means of two no.10 countersunk screws and the holes in the back of the box must be countersunk to receive the screws.

The adaptable boxes shall be of ample size, square or oblong as directed, and of the following minimum internal depths:

20mm conduit entry  
35mm in depth  
35mm and 32mm conduit  
entry 50mm in depth

No boxes smaller than 75mm x 75mm shall be used.

At least 12mm distance shall be allowed between the outer edges of holes cut or drilled in adaptable boxes.

Immediately before wiring, all conduit systems shall be swabbed until dry and clean.

#### **5.10 CIRCULAR PLASTIC CONDUITS**

Where plastic conduits are specified, all conduit boxes, saddles and accessories are to be non-metallic.

They shall be manufactured for screwed or push connections as requested. All screw threads shall be cut with a good quality die which has not been used to cut steel. Where push fit accessories are being used, they are to be welded together by use of the manufacturer's own cement.

The cement will be applied to both surfaces and the tube rotated within the accessory to ensure complete coverage.

No conduit less than 20mm diameter shall be used unless specially sanctioned. Where conduit setting is required, it is to be carried out cold using a steel spring to suit the bore of the tube inserted at the position to be set.

For straight runs of conduit, each length will be joined by means of an expansion coupler, which will allow the tube to expand or contract under changing temperature conditions.

In surface runs, the conduit shall be fixed by means of plastic spacer bar saddles.

The use of nails or spikes for the fixing of conduits will not be permitted.

The following fixing centres for saddles shall not be exceeded:

20mm and 25mm conduit	0.75m
32mm and larger	1.00m

The conduit system shall be arranged so that all cables are completely enclosed and shall be mechanically continuous.

Care should be taken when intending to suspend weight from plastic circular boxes to ensure that the necessary accessories are used to provide a direct fixing to the building fabric.

All accessory boxes shall be constructed of plastic and the conduit welded to them by the use of the manufacturer's cement, as described previously.

Where this is not applicable providing that suitable accessories are used so as to provide a good mechanical connection and they shall be suitably earthed.

In all other respects, the installation of plastic conduit shall be carried out in a similar manner to that specified for heavy gauge screwed conduit.

#### **5.11 OVAL PLASTIC CONDUIT**

Where oval conduit is specified, it shall be manufactured from LSF.

It will be installed in straight vertical drops only, from ceiling voids, terminating in accessory boxes to which it must be securely bonded.

All joints between lengths shall be bonded together.

The conduit shall be fixed by means of plastic saddles or clips, at 1m centres.  
The use of nails or spikes for the fixing of conduit will not be permitted.

Where the conduit is erected in wall chases, care shall be taken to avoid bending and buckling to the contours of the chase.  
These conduits shall be vertically straight.

In all other respects, oval conduits shall be installed in a similar manner to that specified for circular plastic conduit.

#### **5.12 FLEXIBLE CONDUIT**

Flexible metallic conduit shall consist of galvanised flexible metallic tubing, made in conformity with the relevant British Standard and sheathed with LSF.

The flexible conduit shall terminate in specially designed two-part brass adaptors for sealing the LSF sheathing and connecting both to the solid conduit system and/or apparatus.

For connection to plastic conduit systems, flexible plastic conduit shall be used, terminating in an approved type of plastic gland supplied by the manufacturer.

Flexible conduit shall be used for the final connection of rigid conduit systems to the terminal boxes of machines and semi-portable equipment, where a limited amount of movement is required for cleaning and maintenance purposes.

Earth continuity shall be maintained by means of a separate earth conductor of not less than  $4.0\text{mm}^2$  run within the flexible conduit from the terminal box to the first box in the conduit system.

The earth wire shall be attached to the box at each end by means of a sweating or compression socket screw and spring washer.

#### **5.13 LOW SMOKE AND FUME (ZERO HALOGEN) CABLE (LSF)**

This section deals with the use of 250v 440v grade flat low smoke and fume and sheathed cables (LSF) incorporating an earth continuity conductor for mains, sub-mains and sub-circuit wiring.

The black conductor shall be used for the earthed or neutral pole, and the line conductor shall be red.

Any conductors used in the line side which are not red shall be identified by red cable sleeves not less than 20mm in length when fixed.

All cables shall be provided with an earth continuity conductor at termination points.

When the bare conductor is exposed, it shall be sleeved to the full length of the conductor with green coloured sleeving of an appropriate size.

All single pole switches shall be connected in the line cables.

All cables shall be run directly off reels and not taken from loose coils.

No bend in a cable shall have an inside radius of less than four times the width of the cable.

Cables run on the surface shall be fixed by substantial tinned copper saddles, having smooth round edges, with the exception of single runs of cables and the one to be fixed with buckle clips.

Generally, the saddles or clips shall be secured by suitable brass screws and plugs, except that on timber, fixing clips may be fixed by brass pins.

The saddles and clips shall be spaced so that the fixing centres detailed below are not exceeded:

<b>Cable Size</b>	<b>Horizontal Runs</b>	<b>Vertical Runs</b>
up to 2.5mm <sup>2</sup>	200mm	300mm
4.0mm <sup>2</sup> to 10.0mm <sup>2</sup>	250mm	300mm

Where approval is given by the Building Services Engineer, multi-runs on brickwork may be secured to prepared softwood battens, the latter being fixed by screws and plugs.

Where the cable runs on the surface, it shall be carefully dressed down after erection to present a tidy finished appearance.

All runs to be vertical or horizontal with 90° bending at suitable radii and fixed as detailed above.

Where cables are run under floor and in roof spaces, they shall pass through holes in the neutral axis of the joist where possible and as close to the bearing point as practicable.

In no case shall holes be drilled less than 50mm from the top surface of any joists.

Notching of joists will not be permitted.

In roof spaces, where running parallel to the joist, the cable shall be neatly clipped to the side of the joist at intervals not exceeding 450mm.

Where cables are run at right angles to the joist they shall be clipped to the side of battens at least 20mm thick and 50mm wide.

Where cables pass through walls or floor, or may be subject to damage or abuse, they shall be protected by heavy gauge conduit suitable bushed.

Where this type of cable is run through structural steelwork, or any other abrasive material liable to cause damage to the cable, the holes must be reamed and bushed and other above materials protected by an insulating material.

No joint boxes shall be used unless the special permission of the Engineer is obtained first.

The sub-circuit wiring shall be carried out on the looping-in principle and shall be arranged so that joints in the cable are only made at terminals in switches, ceiling roses, socket outlets etc.



Where cables are run on surface, they shall be protected to a height of 2m by heavy gauge conduit, securely fixed at suitable intervals.

Where cables are flushed in walls etc., they shall be protected by a suitable length of plastic conduit, bushed to prevent abrasion of cables.

The use of metal or plastic capping for protection of flush cables will not be permitted. Where flush switches, socket outlets etc., specified, the conduits shall terminate at the box with suitable adaptors designed to securely grip the conduit.

Where cables terminate in surface metal clad accessories bonding nipples shall be fitted to effectively grip the cable, and in other damp situations where water-tight fittings are necessary, the cable shall enter through a suitable rubber-packed water-tight gland.

Contact between the cable sheath and other service pipes shall be prevented by insulating distance pieces.

#### **5.14 LSF INSULATED CABLES**

The wiring for sub-circuits where enclosed in conduit or trunking shall be carried out in LSF insulated cable.

The conductors shall be sized in accordance with the distribution drawing. No cable smaller than  $1.5\text{mm}^2$  shall be used unless specifically authorized.

The wiring throughout is to be the looping-in system and no tee or through joints will be permitted, whether made on site or during manufacture.

All LSF cables shall be delivered to site on drums bearing the manufacturer's name.

When drawing wires into conduits, the Principal Contractor shall provide suitable reels etc., to prevent contact of the wire with the floor.

Also, to prevent any part of the wire being chafed, trodden upon, or accidentally damaged. All boxes shall be cleaned out before wiring,

Lighting, heating, power, fire alarm bell and other low voltage circuits shall be installed separate, and no circuit of any other system shall be installed in the same conduit, or box unless specified in the preceding clauses.

In no case must the cable be drawn into conduits until all such conduits, bends, boxes or other fittings have been fixed permanently in position and approved.

The separated conductors of the same circuit or circuits shall in all cases be drawn into

one conduit.

No reduction of the strands forming the conductors will be allowed in connecting terminals and all the strands shall be efficiently secured by screws, nuts and washers etc.

A reasonable amount of slack cable shall be left in all conduit boxes and switch boxes, care being taken to ensure that no cable is installed under strain.

The number of cables installed in any one conduit or cable trunking shall be such that the space factor laid down in the current edition of the Institution of Electrical Engineers Regulations is not exceeded.

### 5.15 **FLEXIBLE CORDS**

Flexible cords shall be 250V grade and comply with BS6004.

The conductors shall be insulated with LSF core being brown and the other blue.

In the case of triple core flexibles, the third core green and yellow, the separate cores being twisted together to form a circular section and sheathed overall with white LSF.

Glass insulated flexible cables conforming to BS4217 shall be used in any position where excessive heat is likely, ie final connections to tungsten light fittings, heating equipment etc.

The size and number of cores will be detailed in the preceding clauses.

Twin twisted glass insulated flexible cables shall be used generally in positions where it is concealed, but when it is to be used as the visible part of a pendant fitting, a circular cable is to be used.

For final connections to immersion heaters, or other types of heating appliances, flexible cored shall be of the three-core circular sheathed type, insulated with silicone rubber and complying with BS3258.

Heat resistant cables must be used for final connections to all tungsten lighting fitting, open or closed, and cable changing is to take place outside the lighting fitting in a conduit box using porcelain connectors securely fixed to the box.

The box shall then be filled with asbestos string to provide additional protection to the circuit wiring.

The use of plastic connector will not be permitted to any lighting fitting.

### 5.16 **LUMINAIRES**

The Principal Contractor shall allow for the supply, delivery and erection of all luminaires

specified, and as detailed in the schedule, including all accessories for the proper fixing of these fittings.

All fittings shall be left clean inside and outside ready for use.

The final position and mounting height of all fittings will be finalised on site by the Building Services Engineer.

All BS box mounting lighting fittings, shall be secured thereto by means of two brass screws. The wiring to each fitting terminated in a porcelain connector - the fitting being connected to a heat-resisting flexible cord by the method specified in Clause 5.18.

Where detailed in the preceding clauses, lighting fittings may be finally connected by the use of a plug-in type ceiling rose.

This method mainly being used on recessed fittings within a suspended ceiling to enable the installation to be completed and tested, and the whole of the fittings erected on the completion of the suspended ceiling.

#### Ceiling Roses

Ceiling roses shall be white plastic, of the three or four terminal type, as specified, complying in all respects with BS67 and to be of the type and manufacture detailed in the preceding clauses.

### **5.17 ACCESSORIES**

All sub-circuit switches shall be of the slow break AC only pattern, in which the successful operation of the switch does not wholly depend upon the action of the spring and the operating mechanism is insulated from the switch base.  
The switch bases shall be of an approved material.

#### Metal Flush Switches

Metal flush switches shall be mounted in metal boxes.

The cover plates shall not be less than 8mm thick with rounded edges and corners and shall overlap the box by 6mm all round and shall be secured to each switch box with two countersunk screws.

The finish of cover plates and switch dollies or rockers shall be detailed in the preceding clauses.

#### Insulated Flush Switches

Insulated flush switches shall be mounted in metal boxes.

The cover plates shall not be less than 8mm thick with rounded edges and corners and shall overlap the box by 6mm all round and shall be secured to the switch box by means of two countersunk screws.

The finish of cover plates shall be as detailed in the preceding clauses.

### Surface Switches

Surface switches shall be mounted in metal boxes.

The cover plates shall overlap the edges of the boxes and be secured by means of two countersunk screws.

The finish of the plates shall be as detailed in the preceding clauses.

### External Surface Switches

External surface switches shall be of a cast iron type, galvanised, watertight, with rotary action switch, with back of through terminal conduit entry, as applicable.

To avoid surface conduit work on external walls, back entry switches are to be used wherever possible.

### Ceiling Switches

Ceiling switches shall be of the surface or semi-recessed pattern, complying with British Standards.

They shall be constructed from white plastic with a 2m rayon pull cord and suitable for 50mm fixing centres.

In the case of surface units, be complete with white moulded mounting block with earth terminals.

Special care shall be taken to ensure that all switches are securely fixed truly and vertically and that flush mounted switches are flush with the wall finish so that the overlapping cover plates seat onto the rims of the boxes.

At multi-switch positions, the switches shall be contained in multi-gang boxes.

### 13A Socket Outlets - Flush

13 ampere socket outlets flush shall be of the 3-pin flush pattern with square overlapping front plates.

Except where otherwise specified, they shall be provided with an integral switch and,

where specified in the preceding clauses, shall incorporate a pilot light.

They shall be provided with a robust shutter mechanism, operated by the earth pin on insertion, or withdrawal of the plug.

The outlets shall be mounted in metal boxes.

The sockets and boxes shall comply with the British Standards.

The finish shall be as detailed in the preceding clauses.

#### 13A Socket Outlets - Surface

13 Ampere socket outlets surface shall be similar to those indicated above, except that the front plate shall finish flush with the edge of the box.

The fused plugs for use with 13 Amp socket outlets shall be designed to give an easy thumb and finger hold, and shall be provided with a cord grip which will effectively grip flexible cords of all sizes.

#### Fused Spur Units - Flush

Fused spur units (flush) shall be of the pattern with square overlapping front plates, and shall include a fuse, complying with the British Standards in the live pole of the appropriate rating for the apparatus it is connected to.

They shall be designed so that the removal of the fuse holder does not expose any live parts. Where detailed in the preceding clauses, the fused spur unit shall incorporate an integral DP switch and/or a pilot light.

The units shall be mounted in metal boxes and shall be finished as detailed in the preceding clauses.

#### Fused Spur Units - Surface

Fused spur units (surface) shall be similar to those specified before, except that the front plate shall finish flush with the edge of the box.

The socket outlet and fused spur unit called for in the schedule or drawings, shall be supplied and installed in the positions indicated on the drawings.

Where sockets are shown grouped, they shall be mounted in multi-gang boxes where applicable.

## 5.18 EMERGENCY LIGHTING SYSTEM

The Principal Contractor shall supply, install, test and commission all equipment described in the preceding clauses for a complete emergency lighting system.

Self-contained fittings will be used, mounted in compliance with the design requirements, and shall be of the type detailed in the preceding clauses.

Key test switches shall be provided.

An allowance shall also be made to instruct the School, or their representative, in the operation, maintenance and test procedures applicable to this installation, and documentation shall be provided for the Building Services Engineer, confirming that this has been carried out.

## 5.19 EARTHING AND BONDING

All electrical equipment in the new installation shall be bonded to earth by means of the conduit system, metal cable sheath, or a copper conductor.

The size of which shall be as detailed in the IEE Regulations.

All installations shall be earthed to the Electricity Authority's service cable and the Principal Contractor shall comply with all the requirements of the Authority in this respect, and to the requirements of the IEE Regulations.

An earth continuity conductor shall run in one continuous length from the furthest point of the installation to the main earth electrode, and spur section conductors shall be connected to all other metal casings, sheathings, housing electrical apparatus and/or wires and cables.

All spurs shall be connected to the main conductor(s) by permanently soldering or mechanical clamped joints.

The ends of every earth continuity conductor shall be connected by an approved mechanical clamp.

All connections shall be accessible and made secure by screws of non-corroding materials.

Where wiring is enclosed in continuous system of metallic conduit, such conduit will be accepted as earth continuity conductor, provided all joints are electrically sound and the specified resistance figures comply with the IEE Regulations and can be measured and maintained.

The 'series' earthing of one piece of apparatus to another will not be permitted.

All metal sinks and baths shall be bonded to the hot and cold water pipes and waste pipe and to the earth continuity conductor.

Incoming metal, gas and water service pipes shall be effectively bonded to earth; the clamp shall be positioned at a point below the main cut off valve.

## 5.20 TESTS OF INSTALLATION

### Insulation Resistance Tests

On completion of the work comprising the Sub-Contract and again at the expiration of the remedying-of-defects period, tests shall be taken of the insulation resistance of the wiring etc. On the completion of the work, the whole of the installation shall be tested with all switches 'ON' and lamps out, both to earth and between poles, and the insulation resistance shall comply with the requirements of the latest edition of the Institution of Electrical Engineering Regulations of the Electrical Equipment in Buildings.

On the expiration of the maintenance period, all mains and sub-mains shall be tested with fuses withdrawn and final sub-circuits 'bunch' tested to earth with all sub-switches 'ON' and lamps in.

### Continuity Tests

During the progress of the works and on the completion of the work, and again on the expiration of the maintenance period, tests shall be carried out for the electrical impedance of the earth continuity system which, between any one point of the installation, shall not exceed 1 ohm.

An earth loop impedance test shall be made as required by the IEE Regulations to test the effectiveness of the earthing system.

Tests will also be made for any other purpose and in any other way that the Building Services Engineer may consider necessary.

The Principal Contractor shall provide labour and suitable instruments for the tests. Copies of the Instrument Calibration Certificates shall be present at the time of testing and included within the operating and maintenance manuals.

The Principal Contractor shall give sufficient notice (minimum three (3) days) of their intention to carry out completion tests to enable the Building Services Engineer to be present if required. All test results shall be submitted to the Building Services Engineer for verification and included in the operating and maintenance manuals.

The Principal Contractor shall be held responsible for any errors in the results of tests applied to the works.

## **PART SIX**

### **MECHANICAL SERVICES GENERAL REQUIREMENTS**

#### **6.1 INTRODUCTION**

This section sets out the general standards of workmanship to be maintained in this Contract.

The mention of any specific materials, plant or procedure does not necessarily imply that such is to be included in the works.

All component parts of the works shall, unless otherwise specified, comply with the provision of this section or be subject to the satisfaction of the Building Services Engineer.

#### **6.2 BUILDER'S WORK**

Builder's-work, including the provision of holes through walls and floors, chases or ducts in walls and floors, making good and final decorated finishes, will be undertaken by the Principal Contractor unless specifically excluded in the Specification.

For this purpose, the Principal Contractor shall immediately proceed to make all necessary arrangements with the Contract Administrator upon receipt of instructions, and shall mark out all builders' work and provide all necessary information and/or drawings for preformed holes, chases, ducts etc., and shall be responsible for the accuracy of the information.

No structural steel or timber work shall be drilled for the support of cables, fittings etc., without prior approval of the Building Services Engineer.

The drilling of holes for plugs, or similar fixing devices, will not constitute builder's work, and shall be carried out by, and be the responsibility of, the Principal Contractor.

The Principal Contractor shall be responsible for the fixing of all equipment, plant, pipework and ductwork and all other items comprising of the mechanical installation.

All fixings shall be made by the means of screws with plugs or similar approved devices.

All holes for fixings shall be made neatly with a rotary or percussion-type drill.

A cartridge shot-fix tool may only be used at the discretion of the Engineer.

Any damage caused by the Principal Contractor to the finished surfaces, shall be made good by the Contractor at his own expense and to the satisfaction of the Building Services Engineer.



### 6.3 PIPEWORK SERVICES

#### Installation of Piped Services

Installation of all pipework shall follow the detail set out in the accompanying tender drawings, due allowance being made by the tenderer for the diagrammatic nature of the same, and be in accordance with the best accepted practice.

All pipework shall be adequately supported on hangers or on brackets with rollers in order to permit free movement due to expansion and contraction.

Pipework supports shall be arranged as near as possible to joints and changes in direction.

Pipes shall be spaced in relation to one another and to the building structure so as not to interfere with any other service and to allow for the required thickness of thermal insulation as specified later.

All pipework shall be installed to accommodate without distortion the linear expansion when heated.

Pipe supports shall be of the type which will allow full movement of the pipes except at fixed points which shall be provided as necessary between expansion bends, sets or bellows.

The fixed points shall be secured by anchors or an approved design.

Clearance between pipework and finished walls, floors, ceilings and other fixtures should be adequate for cleaning purposes and future dismantling, and shall not be less than the distance given below:

Pipework to floors	minimum distance 100mm
Pipework to ceilings	minimum distance 100mm
Pipework to walls	minimum distance to conform to standard bracket centres

All exposed pipe runs shall be arranged to present a neat appearance and where practical be parallel both with one another and with the building structure taking due regard however to the grading, venting and draining requirements.

All vertical pipes shall be plumb.

All lengths of pipe runs shall be arranged so that the longest length of tube practicable is used between bends, tees and flanges or union.

Short lengths of tube joined together by sockets shall not be permitted.

No joints shall be formed within the thickness of walls, floor or ceilings.

All pipework, valves, fittings and equipment forming the piping installations shall be erected so that it can be dismantled and is accessible for repair provision for dismantling the flange, union etc. can be reached and worked upon either in the open or else by removal of a purpose made duct cover, manhole or similar cover, the fitting is not accessible if, as fixed, it cannot be manipulated.

To facilitate routine maintenance the positions of all valves, drains and supports shall be determined with this aspect in mind.

Grouping of valves, drains, unions, flanges etc., shall be preferred to scattered siting.

Where pipework is not readily accessible it shall be welded.

Unions or flanges shall be provided at valves and equipment so that they can be dismantled. No pipe shall be installed without a flange or union at a point where it passes through a wall, floor or ceiling and is not readily removable.

The Principal Contractor shall include for bends in pipes round piers and all other projections and recesses and for all offsets due to varying thicknesses of plaster, walls, floors, ceilings and other structural works.

It shall be the responsibility of the Principal Contractor to ascertain the skirting heights, cill heights and floor finishes.

No pipework offsets shall be allowed on pipework visible in rooms except as agreed with the Contract Administrator.

Lobster back and cut and shut bends will not be permitted.

Bends, springs and offsets shall be formed by the use of an efficient bending machine. Copper tube may have its bends, springs and offsets formed with springs, or a bending machine.

All changes of direction shall be made with a minimum loss of wall thickness. The diameter shall be maintained, crinkled or scored work will not be accepted.

All cuts from standard lengths of pipe shall have all burrs and swarf removed, the ends shall be trimmed square and shall be thoroughly cleaned before erection.

The Contract Administrator reserves the right to instruct the Principal Contractor to cut

open any sections of pipework for inspection.

Should inspection prove that all the burrs, etc., have been removed the Contract Administrator will pay costs incurred by the Principal Contractor for removing, testing and replacing the section of pipework.

Should inspection prove that all the burrs, etc., have not been removed, the Principal Contractor shall make good any such faults free of cost and shall pay all costs incurred by removing, testing and replacing the sections of pipework.

If, in the opinion of the Building Services Engineer, this result suggests that the standard of workmanship on the whole of the rest of the installation is below that acceptable, the Building Services Engineer shall be entitled to instruct the Principal Contractor to remove the remainder of the installation in whole or in part and have these sections renewed to conform to this specification.

The Principal Contractor in this case shall have no claim for the costs involved in removing and renewing these sections of the works, whether such work is found to be faulty or not. The Contract Administrator's decision shall be final.

Where pipes are held in vices, as when screwing or cutting, care shall be taken to ensure that the pipe surface is not damaged.

Any pipework so damaged shall not be fitted.

Any pipework surface damaged by the scoring of 'Stillsons' whilst being installed shall not be accepted.

The Principal Contractor shall ensure that all pipes, fittings, valves etc., are free from corrosion and internal obstruction.

Pipes and fittings showing signs of corrosion shall not be fitted.

The Principal Contractor shall protect the open ends of all pipework.

Suitable caps, plugs or plastic covers only shall be used to cover the open ends. Wood, rag or paper plugs shall not be used.

The Principal Contractor shall not use a valve fitted to the open ends of a disconnected pipe to prevent the entry of dirt.

Failure to comply with the above instructions shall mean that the Building Services Engineer shall have the right to order the pipework to be dismantled for as far as considered necessary and the pipework to be thoroughly cleaned internally.

The Principal Contractor shall carry out this work free of cost and shall bear the costs

incurred by removing, cleaning and replacing the section of pipework.

#### Grading of Pipework

All pipework shall be installed with continuous gradients to allow for drainage and/or release of air, according to the service concerned.

Gradients shall be generally as follows:

Medium.low temperature hot water (Mains) and chilled water	25mm in 12m
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Medium.low temperature hot water (Branches) and chilled water	25mm in 6m
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Cold water	25mm in 18m
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#### Air Venting of Pipework

Full provision shall be made by the Principal Contractor for air venting of the systems, at all high points in pipework formed by the Principal Contractor whether or not shown on the drawings.

All exposed air bottles, automatic vents, and drip pipes where required shall be properly insulated and protected against frost.

Air bottles on pipework up to and including 80mm bore shall be manufactured from 50mm bore pipe, 100mm bore and over from 100mm pipe.

All shall be 1500mm long with welded end caps and be complete with 8mm lock-shield needle valve complete with key.

Automatic air vents shall be used only where indicated and shall have gunmetal bodies with not less than 15mm connection, copper or stainless steel floats, guides and non-corrodible needs valves.

In all cases the air vent shall be preceded by a lock-shield pattern stop valve and the discharge from the air vent shall be 12mm copper pipe which shall discharge over a gully, sump or other convenient position which shall be agreed in advance with the Engineer.

#### Draining of System

Drain points shall be provided by the Principal Contractor at all accessible points of water services installations and also on the branch side of all main isolating valves and cocks whether or not shown on the drawings.

Drain points shall be fitted with a lock-shield drain cock of gunmetal construction manufactured to the requirements of BS 2879 Type `A' complete with hose union and removable key.

The base of the pocket shall be drilled and tapped to accept a 15mm lever operated plug cock of suitable design.

### Pipework Materials

The materials and technique detailed in these clauses shall be used and employed on the Contract works as appropriate.

The materials for the various services are established below and shall not be varied without the Building Services Engineer's prior consent.

<u>Service</u>	<u>Material</u>
Heating Flow and Return Pipework	Black Mild Steel Galvanised Mild Steel Light Gauge Copper
Hot Water Service, Mains, Copper Boosted and Tank Cold Water Supply Pipework	Light Gauge
Overflow Pipework	Light Gauge Copper

### Mild Steel Pipework

The materials and techniques detailed in these clauses shall be used or employed on the Contract works as required.

All piping and tubing used in the construction of the installed works described in this Specification shall be straight, cleanly finished, round in cross section, free from cracks, surface flaws, laminations and other defects and shall be free from rust and scale.

Standard steel pipes having nominal bores of up to 150mm shall be in accordance with ISO 65 and shall be provided in random lengths of between 4.5m and 7.5m. Gauge of pipe walls shall be in accordance with the heavy grades of the Standard.

Steel pipework over 150mm bore shall be of mild steel manufacture in accordance with BS 3601 HFS/CDS steel 22.

The wall thickness shall be as stated elsewhere in this Specification.

Steel pipework for welding shall be supplied with plain ends bevelled for butt welding.

Where pipes are required for screwed joints they shall be provided with screwed taper threads to ISO7 Part 1.

Steel pipes which are to be used 'black' shall be varnished externally throughout their length after manufacture.

#### Fittings for Mild Steel Pipework

Screwed tees, bends and springs for use with standard steel pipes shall be to ISO 65, 'heavy' grade.

Ends shall be provided with either screwed taper threads to ISO 7 Part 1 or with plain or bevelled ends for welding.

Welding fittings shall be to BS1965 and be manufactured by a forged seamless process from mild steel.

In addition to the range of fittings set out in the standard, branch bends manufactured by the same details may be used.

Ends of fittings, which shall have the same bore and the same wall thickness as that of tube manufactured to 'heavy' grade of ISO65 shall be bevelled for butt welding. Malleable cast iron pipe fittings shall be to BS1256 manufactured by the 'Whiteheart' process to Grade 1 of BS 309 banded or beaded for reinforcement.

Wrought steel pipe fittings shall be manufactured from mild steel by a seamless or welded process to BS1740.

The screwed ends of the fittings shall be provided with parallel female and taper male threads to ISO7 part 1, the axis of the threads being coincident with the true axis of the fittings.

Where specified taper threaded fittings shall be provided and shall be in accordance with BS143. Where practicable all fittings shall be of an easy sweep type.

Branches shall be made using swept tees or branch bends except where an air lock is liable to form, ie., tees on rising mains etc., where square tees shall be used.

Where standard fittings are not available for the duty required, reductions on the run and to the branch shall, in all cases, be made with reducing sockets not bushes.

Reducing fittings on horizontal pipework shall be of the eccentric pattern fixed so as to give a smooth run to the crown of the pipe.

Concentric pattern reducers shall be used on vertical pipework.

All flanges, bolts, nuts and washers shall be manufactured from mild steel to BS4504 appropriate to the pressure specified.

Flanges shall incorporate bolt holes drilled not punched.

Flange faces shall be machined fully across.

When the joints are made the bolt shall project 3mm minimum beyond the nut. Flanges for welding shall be machine faced slip on type, with welding necks trimmed at the edges and spot faced for nuts.

The joint between flanges shall be made up with a full face 'Klingerite' joint ring graphite faced on both sides, and completed using mild steel bolts having a minimum tensile strength of 431 N/mm<sup>2</sup> (28 tons/inch<sup>2</sup>) with nuts and washers.

Unions shall, in all instances, be manufactured with double gunmetal seats as the 'Navy' pattern.

#### Mild Steel Pipework Joints

Welded joints shall be used to fabricate the pipework in the circumstances set out below:

1. Pipework plant rooms
2. Pipework in a sealed system
3. Pipework in ducts and other positions not readily available
4. Pipework in rooms housing electrical switchgear, telecommunications, equipment, computers, control gear etc
5. Pipework 65mm diameter, and above.

Screwed BSPT joints shall be used to fabricate the pipework in the circumstances set out below.

Pipework other than shown in items 1 to 5 inclusive, or where the act of welding would constitute a fire hazard over and above the normal accepted level.

#### Welded Joints

Steel pipes having welded joints on the run shall be prepared for jointing in a manner suitable for the technique employed.

Welding shall be carried out in accordance with BS2971 for metal arc welded joints using covered electrodes and BS1821 and BS2630 for oxy-acetylene welded joints.

Pipes shall be prepared for welding with ends sawn or cut off by hand, flame cut by

machine or flame cut by hand with subsequent trueing up by filing or by grinding to a level of 37.5 degrees as may be required.

Welding rods shall in all cases be of good quality copper coated low carbon steel and the manufacturer shall provide test certificates representative of the rods used in accordance with BS 1453 Group A.

All welded joints produced by the oxy-acetylene flame process shall be of best quality, the butts being slightly convex with regular ripples and no undercutting, washing away or surface cavities being present.

Notches at the roof indicating incomplete penetration and excessive weld protruding into the pipe bore in excess of 1.5mm shall not occur and the external reinforcement shall run out smoothly to the pipe surface and either side.

Welding shall in all cases be carried out by skilled craftsmen who are in possession of a current certificate of competency issued by an approved authority (which shall be produced at the request of the Engineer) and have had a suitable period of experience for the class of work in which they are engaged, in accordance with BS4870 and BS4871.

Highly skilled non-certificated welders may only be used by written permission of the Building Services Engineer, and test welds in accordance with BS4872 Part 1 with satisfactory laboratory test certificates shall be submitted before this permission is granted.

The Building Services Engineer shall determine a suitable independent testing authority and any costs arising from these tests shall be the responsibility of the Principal Contractor.

Each welder shall be assigned a reference which shall be stamped on each weld and when the general hydraulic tests of the completed systems are carried out, as detailed elsewhere.

Each weld shall be lightly hammered during the time that pressure is maintained.

If any leaks occur at welds the portion of the weld near the leak shall be cut out and rewelded. Such leaks shall not be repaired by caulking or attempted fusion of the surrounding metal.

Should a considerable portion of the welded joints made by a particular operator be found to be defective due to faulty workmanship, all such welds shall be cut out and rewelded by another operator whose work has proved satisfactory.

During the progress of the works, inspections will be may by the Building Services



Engineer, to ensure quality of welding.

The Building Services Engineer reserves the right to instruct the Principal Contractor to cut open any sections of pipework which include welded joints and to have these parts laboratory tested.

If the test and inspections should prove that the welds are to the required standard, the Contract Administrator will pay the costs incurred by the Principal Contractor in removing, testing and replacing the sections of pipework.

If, however, the inspection and tests show that the welds are below the class of workmanship for this class of work, or if they are found to be faulty in any respect, the Principal Contractor shall make good any such faults free of cost and shall pay all fees incurred by the tests.

If, in the opinion of the Building Services Engineer, this result suggests that the standard of workmanship on the whole of the rest of the welded work is below that required the Contract Administrator shall be entitled to instruct the Principal Contractor to remove the remainder of the welded sections in whole or in part, and have these sections renewed to conform with this specification.

The Principal Contractor in this case shall have no claim for the costs involved in removing and renewing these sections of the works, whether such welds are found to be faulty or not.

The Contract Administrator's decision shall be final.

During all welding or cutting operations, the welder shall be accompanied by a competent assistant and suitable asbestos mats shall be used to protect the building fabric and decorations.

Every precaution shall be taken to prevent damage by scorching or fire, but the Principal Contractor shall provide the welders with two portable fire extinguishers for use in an emergency.

All changes in direction shall be proportioned so that the ratio between the centre line radius of the bend and the inside diameter of the pipe is not less than 1.5 to 1.

All bends where practicable shall be formed in the pipe run (ie made bends). Where standard welded fittings are used they shall be of the same quality as the pipe and shall conform to BS1965.

Bends shall be 90 degrees, long radius type unless space for pipework is restricted and in which case the short radius welding elbow may be used subject to the approval of the Building Services Engineer.

Cutting and shutting will not be permitted.

If bends and springs are manipulated on site, then cold bending by a hydraulically operated machine will be permitted for standard steel pipes having a bore of 32mm and less but larger pipes should be bent hot.

All bends shall be normalised by heat treatment after manipulation.

All sets, double sets and springs shall be formed from long lengths of tube with as large a radius as possible and shall be free from distortion.

Where junctions to steel mains are formed by factory or site welding, such work shall be carried out to the above standards for steel tubulars.

All necessary reinforcement by way of plates, collars or shoes shall be provided.

All branch bends where possible shall be formed by the use of special welding fittings of the same quality as the pipe and shall conform to BS1965.

Where branch bends are used, the profile of the hole shall be carefully set out to match the fittings and where the holes are flame cut, all loose scale and oxide shall be removed from the main before the branch is welded into position.

The distance between the centres of two adjacent branch welds shall not be less than twice the diameter of the large branch.

After cutting or welding, all flashings shall be removed from all pipework before erection. All welded joints shall be painted two coats of red oxide on completion of the joint.

### Screwed Joints

Steel pipes having screwed joints shall be carefully reamed out before the plain end is screwed.

When making a joint the screw thread shall be coated with a white jointing compound to BS5292 and good quality hemp, all surplus jointing compound being finally cleaned off to leave a surface suitable for painting.

Polytetrafluoroethylene (PTFE) tape may only be used with the prior agreement of the Building Services Engineer.

The joint shall be arranged so that on completion two or three threads are left showing.

Should a screwed joint prove defective under subsequent test, caulking will not be allowed.

### Flanged Joints

Steel pipes having flanged joints to BS10 Part 2 shall be prepared to suit the method of attachment required.

Pipes not galvanised shall be provided with flanges screwed or welded on for nominal bores of 30mm or below and with flanges welded on for larger sizes.

Galvanised pipes shall be provided with galvanised flanges screwed on for nominal bores of 100mm and below with flanges welded on prior to galvanising the pipe for larger sizes.

Where flanges are secured by screwing, the threads on the tube shall be arranged to end at a point just inside the bore of the flange so as not to interfere with the joints.

After the flange has been screwed on the tube shall be expanded into the flange by a roller expander.

Welding flanges shall be of the slip-on pattern with neck, secured by welding both the neck and bore of the flange to the pipe, with the tube finishing 3mm inside the bore. Care should be taken not to distort the machined face.

### Copper Pipework

The materials and techniques detailed in this section shall be used or employed on the works as required.

The following light gauge copper tube types shall be used where specified, the use of difference grades may be required, and these shall be detailed in the relevant sections of the Specification.

All tubes shall be solid drawn from phosphorous de-oxidised non-arsenical copper to BS6017 free from any deleterious film.

Half-Hard - Light gauge in accordance with BS2871 Part 1 Table X.

All piping and tubing used in the construction of the various plants described in this Specification shall be straight, cleanly finished, round in cross section, free from cracks, surface flaws, laminations and other defects.

### Fittings for Copper Pipework

Capillary and compression fittings shall be to BS864 Part 2 Type 'A'.  
All fittings shall be manufactured from materials being non-dezincifiable.

All fittings shall be suitable for working conditions of the system, and purpose made

fittings shall be made throughout.

All branch connections shall be by purpose made tees either square or sweep to suit the application.

Where practicable fittings shall be of the long sweep pattern.

Where standard fittings are not available for the duty and sizes required, reductions shall be made with purpose fittings.

Where light gauge copper tubes are pulled on site to form bends and offsets, the materials used shall be as for adjacent straight lengths.

Tubes having nominal bores up to 28mm may be bent cold but larger sizes shall be annealed before manipulation.

In all cases, tubes shall be loaded prior to bending, with springs, low melting point alloys or an inert sand, care being taken that contamination of the tube material is avoided. Where bending machines are used these shall have smooth clean guides and formers, any scored or damaged tools being rejected.

No pulled bends with deformity whatsoever resulting in the deforming of the bend will be permitted.

Where it is intended to use compression fittings on underground pipework, the Principal Contractor shall ensure that the fittings shall be of the Type 'B' pattern and inform the Engineer accordingly.

Unions shall be manufactured from gunmetal and shall be in accordance with BS864.

#### Copper Pipework Joints

All jointing of copper tubes shall be strictly in accordance with the fitting manufacturer's recommendations.

Where capillary fittings are used, care should be taken to ensure that the solder used is suitable for the temperature conditions of the system.

All solder droppings and surplus flux shall be removed on completion of the joint. During all jointing operations using capillary fittings, the fitter/plumber shall be accompanied by a competent assistance and suitable assistant and suitable asbestos mats shall be used to protect the building fabric and decoration.

Every precaution shall be taken to prevent damage by scorching or fire, but the Principal Contractor shall provide the fitters/plumber with two portable fire extinguishers for use in an emergency.

### Supports and Fixings

All pipework shall be adequately supported and bracketed and must allow adequate free and/or guided movement due to the operating conditions prevailing.

The Contractor shall include for the supply of all necessary supports and brackets complete with all bolts, screws and insert or plug fastenings.

Particular importance must be made to the design and method of supports and brackets for pipework and equipment.

Care should be exercised regarding strength of material, construction, method of fixing, practicability and appearance when designing brackets.

Drawings of all brackets and supports shall be forwarded to the Engineer for approval before manufacture is commenced.

Details of all patent fixings to the building fabric shall also be submitted to the Building Services Engineer for prior approval.

Softwood plugs will not be permitted.

The Principal Contractor shall be responsible for the positioning and marking out of all brackets and supports.

Vertical pipework shall be adequately supported at the base of the riser and at all intermediate levels.

Branch circuit pipes shall not be used as a means of support for the riser main. Brackets and supports shall be set out so that they do not obstruct the access to valves, flanges or fittings requiring maintenance.

Pipes shall not be supported from each other but when there is no alternative the Building Services Engineer's written approval must be obtained.

The brackets so installed shall not prevent the removal of any individual pipe where necessary and provision shall be made for unequal expansion.

Pipes shall not be supported from any item of equipment.

All high-level pipework is to be carried on neat galvanised swivel hangers with GM split rings or steel glands suitably spaced to prevent sagging and to allow expansion, and contraction.

Brackets, hangers and supports to be as follows:

Brackets

- (a1) Brackets to walls Flat iron with fish tail  
end minimum size 40mm x 6mm
- (a2) Brackets to walls Angle iron with fish tail  
end minimum size 32mm x 32mm x 6mm
- (b) Brackets to RC Rag bolt with eye built in beam minimum size 15mm diameter
- (c) Brackets to RSJ Girder clips
- (d) Brackets suspended from flat roofs Rod with eye (minimum size 9mm diameter) on underside with back plate and lock nut on top side
- (e) Rods (minimum size 9mm diameter) with purpose made hook and/or eye
- (f) Tubes (minimum bore 6mm) with chandelier hooks or ring

sockets Supports

- (a) Smithy purpose made band (minimum size 25mm x 3mm strap) with bolt and nut for all services except H and CWS up to 54mm bore
- (b) Smith purpose made stirrup (minimum size 32mm x 3mm) with loose pipe roller on bolt and nut with additional lock nuts for all services except H and CWS up to 54mm bore (minimum size of bolt and roller 9mm and 20mm respectively)
- (c) GM split ring for H and CWS up to 54mm bore or, alternatively, bank clips made from heavy gauge brass strip, which shall be used to H and CWS above 54mm bore

Any combination of the above will be allowed, providing that uniformity of type is adopted through the various sections of the building.

All hangers and supports except at necessary fixed points, must be allowed to swing freely to make up expansion and contraction.

All low-level pipework to be supported by Munsell ring and tube secured into walls by brass anchor fixings.

All Brackets, Hangers and Supports are to be Galvanised after manufacture.

When determining the position of brackets and supports, care should be taken to ensure that ample clearance from walls and between pipes is allowed for insulation. The spacing distance between brackets and supports to be as follows:

All sizes of copper piping	2.0m	apart
15mm to 50mm steel piping	2.3m	apart
65mm and over steel piping	3.0m - 4.0m	

In addition to the centres given, supports shall be provided adjacent to all valves, flanged joints and other special components to prevent undue strain on the adjoining pipework and so that the equipment or sections of pipework may be removed, leaving the adjoining pipework adequately supported at the ends.

Main walls and partition walls etc., where pipes pass through sleeves, shall not be considered as pipe supports.

Pipe Sleeves

In all cases where pipes pass through walls, floors, ceilings and footings the Principal Contractor shall provide sleeves which shall be built in.

Sleeves shall in no case be used as pipe supports, a free annular space always being provided. Puddle flanges shall be provided on pipework passing through walls intended to be covered by earth etc., or where passing through bund walls.

Sleeves shall be of pipe cuttings properly reamed, cleaned and trimmed to 90° to bore. Sleeves in load-bearing walls or footings shall be cast iron pipe.

Sleeves in non-load-bearing walls, floors, ceilings and partitions shall be in copper or mild steel to suit the particular pipe material.

External flashing sleeves shall be provided by the Principal Contractor except where indicated otherwise.

They shall incorporate an integral flange to which a flashing shield can be clamped or welded. The shield shall be built into the membrane and the space between the sleeve and pipe filled with waterproof material or mastic compound.

Inside diameter of sleeves shall be not less than 12mm larger than the outside diameter of the pipe, except where pipes pass through load-bearing walls or footings where sleeves shall be 100mm larger than the outside diameter of the pipe.

For pipes which change direction over-sized sleeves the size larger than normal shall be fitted, to allow for expansion.

The space between the pipe enclosed and its sleeve shall be caulked with a suitable material. Sleeves shall not protrude from the finished face of walls.

In toilets, kitchens and all other situations where the floor may be swilled, the sleeve shall project 30mm above the finished floor level.

#### Floor Plates

Where exposed to view, pipes and tubing passing through walls, floors, ceilings, partitions and false ceilings of occupied rooms shall be fitted with a heavy chromium-plated die cast zinc alloy masking plate.

Such plates shall be split on the diameter, to be a snug fit to the pipe concerned and provided with countersunk holes for set screws.

#### Expansion Loops and Bellows

The Principal Contractor shall provide and fix all the requisite expansion loops formed in the pipe runs by means of long radius welded elbows to the required dimensions. The loops shall be formed in the mains with mild steel flanges and each leg of the loop shall be pulled cold to approximately 50% of the estimated expansion of the leg (this will be amended as appropriate to suit the medium being transported in the pipe).

Single and double expansion bellows shall be installed as necessary to absorb the axial movement of the pipelines and these shall have screwed or flanged ends as circumstances dictate.

The bellows shall be installed with due allowance having been made for cold draw which will vary according to the type and length of bellows proposed and the temperature of the installation.

Where 'installation bars' or fittings are incorporated with the bellows during delivery and erection these must be removed before heat is applied.

The full expansion rate of the bellows and/or loop shall be as indicated on the equipment schedule.

Care shall be taken when installing flanged end bellows to line up the bolt holes on joint and mating flanges and to ensure that the joint is not twisted in any way, or any torsional stress applied.



Free guide sleeves shall be fitted on each side of the expansion joint unless such joint be installed adjacent to an anchor point when guides shall be fitted on the free side only.

Guides shall consist of a tube of diameter not more than 3mm greater than the outside diameter of the main with a minimum length of 150mm or framework fastened rigidly but permitting axial movement while restraining the pipe from radial movement.

Guides shall have a clearance of not more than 3mm between the outer surface of the pipe and the inner surface of the guide and shall be to the following lengths.

<u>PIPE SIZE</u>	<u>LENGTH</u>
Up to 32mm diameter	300mm
40mm up to 100mm diameter	450mm

Guides shall be installed not more than 1.5 pipe diameters from the expansion joint to the first guide and not more than 20 pipe diameters between this guide and the next pipe support.

When installing manufactured expansion loops or bellow joints, the manufacturer's installation recommendations shall be observed in every respect.

When pressure testing pipework distribution mains the Principal Contractor shall ensure that the test pressure will not damage the bellows.

Where the test pressure exceeds the maximum operating pressure, the Principal Contractor shall include for temporary spacer pieces to be installed for the duration of the tests.

Where no bellows or loops are specified, provision for expansion and contraction of pipework shall be made by changes in direction and it shall be the responsibility of the Principal Contractor to make sufficient allowance for this.

Branch connections are to be taken from the top or bottom of both flow and return mains depending on the prevailing air venting arrangements.

Branches will have incorporated in them two bends before passing into ducts, trenches, vertical chases, etc.

The bends shall be so arranged as to take up the expansion and contraction of the mains without putting any extraneous strain onto the particular branches.

Anchor Points

Where indicated on the drawings or as required mild steel anchors shall be installed to resist the maximum stresses of the pipework.

The anchor shall be fixed onto solid building fabric.

The anchor shall consist of heavy section iron `U' straps welded to the pipework and attached to the supports by nuts and bolts.

Where fixed to brickwork short channel irons shall be attached to the wall to obtain a fixing for the `U' straps.

All cleats, brackets and steelwork required for building in shall be supplied by the Principal Contractor.

Details of all anchors shall be submitted to the Building Services Engineer for approval before manufacture.

Protective Painting

All materials including sundry iron and steel brackets, guides and anchors shall be primed before delivery to site, or after fabrication on site.

Protective coatings removed or damaged shall be thoroughly wire brushed and cleaned before repainting with red oxide primer prior to erection.

Valves and Stopcocks

Valves and stopcocks shall conform with the following table:

Service	Manufacturer	Valve and Stopcock Figure Number	Fitting Position and Remarks
Heating Pipework	Oventrop	107 90	Up to and including 50mm
Heating Pipework	Oventrop	107 92 (lockshield)	Up to and including 50mm
Heating Pipework	Oventrop	104 82	65mm and over
Fan Convectors and pipe coils	Oventrop	107 94 (screwed bsp T handle)	Up to 20mm

Fan Convectors and pipe coils	Oventrop	107 94 (compression T handle)	15mm and 22mm only
Mains Cold Water	Yorkshire	514 GM with loose jumper	Up to and including 54mm
Mains Cold Water	Oventrop	104 84	65mm and over
Boosted tanked cold and hot water services	Yorkshire	514 GM with fixed jumper	Up to 54mm and where there is no circulation
Boosted tanked cold and hot water services	Oventrop	107 95 104 84	Up to 54mm 65mm and over
LTHW and chilled water drain cocks	Oventrop	103 33	DN 10 to DN 25
Gas ball valve	Oventrop	301 64	DN 15 to DN 50
Gas butterfly valve	Oventrop	104 83	DN 65 to DN 200
Domestic hot water secondary return	Oventrop	Aquastrom T Plus 420 55	DN 15 to DN 25
Water services double check valve	Oventrop	440 00 440 01	15mm – 28mm DN 15 to DN 50
Water services single check valve	Oventrop	440 10 440 11	15mm – 28mm DN 15 to DN 50
Water services pressure reducing valves	Oventrop	440 60 440 61 440 62	15mm – 28mm DN 15 to DN 50 (union end BSP) DN 15 to DN 50 (BSP)
Water Services Thermostatic mixing valve 3	Oventrop	130 03 58 130 03 59	15m m 22m m
Water Services service ball valves	Oventrop	107 93 04 107 93 06	15mm 22mm

Water Services combined flow regulator ball valve and strainer	Oventrop	440 21 04	4 litres/min (15mm)
		440 22 04	6 litres/min (15mm)
		440 23 04	8 litres/min (15mm)
		440 24 04	10 litres/min (15mm)
		440 25 04	12 litres/min (15mm)
		440 26 04	15 litres/min (15mm)
LTHW and chilled Water Commissioning sets	Oventrop	106 08	DN 15 – DN 50
LTHW and chilled Water Commissioning sets	Oventrop	106 09 64	DN 15 only low flow 0.01 – 0.035 l/second
LTHW and chilled Water Commissioning sets	Oventrop	106 09 34	DN 15 only med flow 0.036 – 0.07 l/second
LTHW and chilled Water Commissioning sets	Oventrop	106 28	DN 65 – DN 300
LTHW and chilled water Double regulating valves	Oventrop	106 01	DN 15 – DN 50
LTHW and chilled water Double regulating valves	Oventrop	106 11 64	DN 15 only low flow
LTHW and chilled water Double regulating valves	Oventrop	106 26	DN 65 – DN 300
LTHW and chilled water Strainers	Oventrop	112 00	DN 15 – DN 50
LTHW and chilled water Strainers	Oventrop	112 20	DN 65 – DN 300

### Check Valves

Check valves up to an including 54mm to be as Oventrop 107 50 screwed connections.

Check valves 65mm and above to be as Oventrop 107 25 with flanged PN 16 connections.

### Automatic Air Eliminators

These shall be as Oventrop 108 82 with 10mm bsp female inlet and 10mm bsp male outlet with a copper discharge pipe to drain on the outside of the building.

### Safety Valve

All safety valves shall be as NABIC figure no. 42 to the size and set to discharge at the pressure indicated on the drawings or in the Supplementary Specification.

### Strainers

These shall be to the sizes and types as detailed on the drawings, with a mesh of a size approved by the Building Services Engineer prior to ordering.

Strainers shall be flanged on sizes 65mm and over and shall be provided with drain facilities in the clean out connection at the bottom of the body construction.

### Drain and Draw-Off Cocks

Any equipment or components supplied within the terms of the Contract which are fitted with condensate trays, drains, overflows or discharge collection points, shall be provided with drain pipes extended to the nearest gully or drain, (complete with waterseal and tundish, when required, by an approved route).

## 6.4 THERMAL INSULATION

### General

All thermal insulation materials shall be non-combustible when tested in accordance with BS476 Part 5 and shall possess a minimum Class 1 surface spread of flame rating when tested in accordance with BS476 Part 7 1971.

Regard shall be taken of the fact that no materials shall emit smoke or toxic in the event of fire.

Thermal insulation on pipework, tanks, etc., shall be provided generally in accordance with the recommendation of BS5422:1977, Specification for the use of Thermal Insulating Materials.

After all site tests specified in this part of the Specification have been carried out to the satisfaction and approval of the Building Services Engineer, the Principal Contractor shall insulate all portions of the installations to the extent detailed below.

The insulation to be provided under this Contract will be inspected closely to ensure that it complies in detail with the Specification and the Principal Contractor shall therefore employ a specialist for this work.

This specialist shall be a member of the Thermal Insulation Contractor's Association. The Principal Contractor shall state the name of the specialist they propose to employ at the time of tendering.

In the event of the material having a greater conductivity than is specified, all such material shall be removed from site and new consignments delivered, samples of which shall be tested at the Principal Contractor's own expense until the required conductivities are obtained.

To ensure that the correct thickness of covering has been applied, the Principal Contractor shall, if required by the Building Services Engineer, cut one or more sections of the finished covering. If the insulation is to the satisfaction of the Building Services Engineer, the Principal Contractor shall be reimbursed the cost of cutting away and making good.

If, however, defects are revealed, the Principal Contractor shall, at their own expense, remove the whole of the covering and provide and fix new insulation to the satisfaction of the Building Services Engineer.

Where any work is carried out on existing thermal insulation material or finish which contains asbestos in any form, the Principal Contractor's attention is drawn to his responsibility under the provisions of the Asbestos Regulations.

### General Extent of Painting

The Principal Contractor shall paint:

- a) All plant and equipment unless already suitably finished by the manufacturer, in Boiler rooms, Plant Rooms etc.
- b) All un-galvanised ferrous pipework and all insulation surfaces in Boiler/Plant/Tank Rooms, trenches, except as excluded by the requirements of paragraph (e) below.
- c) All supporting steelwork, brackets, supplied by the Contractor.
- d) Pipework delivered to site already primed shall have a further coat of approved primer after erection.
- e) These items will be painted by the Principal Contractor to match the surrounding surface area finishes:

Galvanised steel or aluminium sheet cladding for insulation protection.

### Method of Painting

#### Painting of Pipework, Plant, Equipment and Steelwork

- a) Pipework, plant, equipment and steelwork to be painted shall first be thoroughly descaled and cleaned by wire brushing and shall then be painted with one coat of best quality chromatic priming paint, irrespective of whether an insulation covering is applied or not.
- b) Excepting where insulation is scheduled, the primary paint coat shall be followed by one undercoat and one gloss topcoat of a suitable (eg heat resisting) paint of a colour to be selected by the Engineer.
- c) Where insulation is to be applied, the primary coat shall be heat resisting and shall be followed by the application of insulation.

### Paint Materials

- a) All paints shall comply with the appropriate British Standard.
- b) Undercoats and finishing coats shall be of the same manufacture.

### Brightwork

- a) All bright steel and chromium plated parts and small-bore copper tube connections to gauges and instruments shall be burnished and polished.

## **6.5 INSPECTION AND TESTING**

### Testing of Pipework

The whole installation shall be hydraulically tested to twice the working pressure of the systems or 4.136 bar whichever is the greater.

This pressure shall be maintained for a period of two (2) hours in each, and due allowance shall be made for attendance during the progress of such tests.

All leaks are to be immediately repaired and the installations re-tested until the above requirements are obtained.

All tests are to be carried out before application of the paint or insulation and valve adjustments made with the circulating pumps in operation.

### Commissioning

The systems shall be commissioned in accordance with CIBSE Commissioning Codes, and the Principal Contractor shall prepare pre-commissioning check lists, commissioning record sheets and programme for the Contract Administrator's approval two (2) weeks prior to the commencement of commissioning.

No commissioning works may commence on incomplete systems.



**PART SEVEN****SCHEDULES**

- 7.1 Schedule of Drawings
- 7.2 Manufacturers and Places of Manufacture
- 7.3 Departures from Requirements of this Specification
- 7.4 Alternative Equipment
- 7.5 Sub-Contractors and Suppliers
- 7.6 Schedule of Dayworks - Electrical
- 7.7 Schedule of Dayworks - Mechanical
- 7.8 Schedule of Prices

## 7.1 SCHEDULE OF DRAWINGS

13-45-M-01	BASEMENT PLANTROOM BOILER & LTHW SYSTEM REPLACEMENT MECHANICAL SERVICES INSTALLATION PROPOSED WORKS
13-45-M-02	GROUND FLOOR PLAN LTHW PIPEWORK REPLACEMENT MECHANICAL SERVICES INSTALLATION PROPOSED WORKS

**7.2 MANUFACTURERS AND PLACES OF MANUFACTURE, TESTING AND INSPECTION**

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Description	Manufacturer	Place of Manufacture
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Signature \_\_\_\_\_

Company \_\_\_\_\_

Date \_\_\_\_\_

**7.3 DEPARTURES FROM REQUIREMENTS OF THIS SPECIFICATION**

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Clause no.	Details
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---

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Signature \_\_\_\_\_

Company \_\_\_\_\_

Date \_\_\_\_\_

**IMPORTANT NOTE**

**Unless the tenderer details all the points of departure from this specification, it is deemed that his tender complies in every respect with this Specification.**

**7.4 ALTERNATIVE EQUIPMENT**

**Details of any equipment or arrangement which the tenderer wishes to put forward as an alternative to that shown on the drawings or specified in the Schedules.**

---

Item	Description	Manufacturer
------	-------------	--------------

---

---

Signature \_\_\_\_\_

Company \_\_\_\_\_

Date \_\_\_\_\_

**7.5 SUB-CONTRACTORS AND SUPPLIERS**

**The Tenderer shall state in the following Schedule details of all Sub-Contractors that he proposed to employ for the manufacture and/or installation of any part of the works.**

---

Description	Name and Address of Sub-Contractor
-------------	------------------------------------

---

---

Signature \_\_\_\_\_

Company \_\_\_\_\_

Date \_\_\_\_\_

**7.6 SCHEDULE OF DAYWORKS - ELECTRICAL**

For the purposes of calculating the nett prime costs of daywork, the definitions prepared and agreed between the ECA and the RICS shall apply in respect to materials, labour and plant. The nett prime costs shall be defined as nett costs of payment made by the Contract Administrator to the Principal Contractor. The following percentage additions shall be applied to the nett prime costs to cover for overheads and profit.

**LABOUR**

Item	Description	Rate £	On Costs %
1.	Commissioning Engineer		
2.	Foreman		
3.	Chargehand		
4.	Electrician		
5.	Assistant		
6.	Labourer		
7.	Craft Apprentice		

**LABOUR**

Materials                      On Costs%

**Plant**

Plant                              On Costs%

\_\_\_\_\_  
Signature\_\_\_\_\_  
Company\_\_\_\_\_  
Date

**7.7 SCHEDULE OF DAYWORKS - MECHANICAL**

For the purposes of calculating the nett prime costs of daywork, the definitions prepared and agreed between the HVCA and the RICS shall apply in respect to materials, labour and plant. The nett prime costs shall be defined as nett costs of payment made by the Contract Administrator to the Principal Contractor. The following percentage additions shall be applied to the nett prime costs to cover for overheads and profit.

**LABOUR**

Item	Description	Rate £	On Costs %
1.	Commissioning Engineer		
2.	Foreman		
3.	Chargehand		
4.	Fitter		
5.	Plumber		
6.	Lagger		
7.	Assistant		
8.	Labourer		
9.	Craft Apprentice		

**LABOUR**

Materials                      On Costs%

**Plant**

Plant                              On Costs%

\_\_\_\_\_  
Signature\_\_\_\_\_  
Company\_\_\_\_\_  
Date



**7.8 SCHEDULE OF PRICES**

**ELECTRICAL SERVICES INSTALLATION**

- 1. Removal/modifications to existing services (plantroom)
- 2. Testing and commissioning
- 3. As-fitted drawings/Operating and Maintenance Manuals

**SUB TOTAL - ELECTRICAL  
TO COLLECTION**

£

---

---

**MECHANICAL SERVICE INSTALLATION**

1. Removal/modifications to existing services
2. LTHW & gas supply heating works (plantroom)
3. LTHW heating works (main school building)
4. Flue specialists works
  - i) Removal of existing flue installation in plantroom
  - ii) New flue installation works
5. Controls specialists works
6. Thermal insulation
7. Testing and commissioning
8. As-fitted Drawings/Operating and Maintenance Manual
9. Water treatment
10. Demonstration to the Employer
11. Builders-work and fire stopping
12. Provisional Sum for builders-work (plantroom) £5,000.00
13. Contingency Sum £5,000.00

**SUB TOTAL - MECHANICAL  
TO COLLECTION****£**

**COLLECTION**

<b>SUB-TOTAL - ELECTRICAL</b>	<b>£</b>	
<b>SUB-TOTAL - MECHANICAL</b>	<b>£</b>	
		<hr/>
<b>TOTAL</b>	<b>£</b>	
		<hr/>

The Principal Contractor will be selected based upon a thorough review of the information returned within this document and allied to any pertinent information contained within a submission letter.

The Principal Contractor will include within their tender all rates, percentages, etc., as deemed necessary to complete the works described within the specifications and project specific drawings.

All costs, rates and percentages shall be offered on a fixed price basis all as generally described within the Contract Conditions and documentation.

All parts of this tender documentation must be completed by the Principal Contractor to deem the submission as compliant.

It is accepted that the Principal Contractor will familiarise themselves with all aspects of the Principal Contract Conditions and Preliminaries together with the Engineer Services specifications and project specific drawings.

The tender costs will be based upon the named manufacturers only; however, the tenderer may propose alternatives separately within the Schedule of Manufacturers.

7.8 **SCHEDULE OF FIRE STOPPING TECHNICAL LITERATURE**



Intubatt



**Fully identifiable, fire resistant ablative skinned rock mineral wool board. Used for the re-instatement of service openings passing through fire compartment walls and floors.**

**Description**

Intubatt is a factory finished unique multi-layered, low resin bonded, rock mineral fibre board. Firetherm ablative coated on both faces with our unique Optifire-identifiable coating. Manufactured under controlled factory conditions to ISO 9001 to the required thickness and specification. Intubatt may be over coated using a suitable emulsion or eggshell paint for decorative purposes.

Optifire traceable

integrity up to 240 minutes

smoke down up to 240 minutes

**Dimensions and Colour**

Size: 1200 x 600 x 50 mm  
1200 x 600 x 70 mm  
Weight: 8 kg (+/- 0.5 kg) (0.72 m<sup>2</sup>)  
Density: 140 kg nominal  
\*180 kg also available  
Colour: Off white  
Coating: 1.00 mm - incorporates Optifire traceability

\*Greater acoustic performance

**Fire Testing**

- Tested at Exova BM Trada to BS EN 1366-3 and BS 476 Pt 20/21/22
- Tested at Exova Warrington Fire to BS 476 Pt 20, 21 and 22
- Third party accredited by Exova Warrington Fire, certificate number CF 580



**Maximum Openings**

- Maximum opening framed 3000 x 2400 mm flexible construction
- Maximum opening wall 1500 x 1500 mm 2000 x 1100 mm
- Maximum opening pattress 1400 x 400 mm

**Features**

- Water repellent core
- Fully identifiable using Optifire
- Easy to cut and flexural
- Service movement up to 7.5% (+/- 3-7.5%), maximum 3.75 mm  
Fire Deflection +/- 3.75%, maximum 45 mm
- Fully tested for up to 240 minutes integrity and insulation
- Service capable
- Air pressure tested up to 2000 Pa

**Applications**

Intubatt is used to reinstate compartment wall and floor openings to maintain the required fire resistance, and assist with the reinstatement of acoustic capability. Intubatt is suitable for use around services such as suitably supported fire rated dampers, pipe work and electrical cabling, against the passage of fire providing up to 4 hours integrity and insulation in blockwork and up to 120 minutes integrity and insulation in drywall.

**Typical Service Types:**

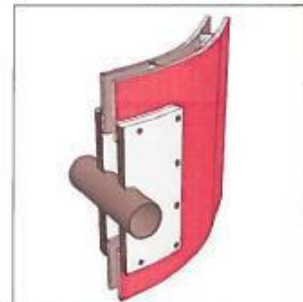
- Cables
- Steel pipes
- Insulated non-combustible services
- Copper pipes
- Cable trays
- Combustible pipes
- Dampers
- Ducting

Firetherm recommend that all fire stopping products should be installed by a competent person or accredited fire-stopping contractor. Full and detailed application methodology instructions are available and should be requested before installation commences.

**Installation**

1 x 50 mm Intubatt up to 120 minutes integrity up to 120 minutes insulation.  
2 x 50 mm Intubatt up to 240 minutes integrity up to 240 minutes insulation.  
For service fire insulation, contact Firetherm. Acoustic capability of up to 59 dB within a 1 m<sup>2</sup> opening.

**Typical Dry Lining Details**



Curved dry lining wall pattress



Dry lined wall with 2 lined layers on Intubatt each side

Firetherm Intumescent & Insulation Supplies Limited  
Unit F Acorn Industrial Park, Crayford Road, Crayford, Kent DA1 4FT  
Phone: 01322 551010 Fax: 01322 552727 Email: sales@firetherm.com www.firetherm.com



This data sheet offers guidance limited to the testing results and does not offer methodology of the installation of this product. Suitability of this product and its usage to substrate type, service type and fire requirement must be confirmed before installation commences. A specific detail relevant to installation must be requested. Firetherm recommend that all fire stopping products should be installed by a third party accredited fire stopping contractor or competent person. Full application details and methodology instructions should be requested before installation of this product commences. Suitability of this product should be reviewed before installation. Standard terms and conditions apply at all times.

# Intubatt Method

Optifire  
traceable

Integrity  
up to  
**240**  
minutes

made from  
100%  
**240**  
minerals



- The detailed installation drawing relevant to actual substrate should always be referenced and referred to. Product and safety data sheets should be referenced before any work commences.
- Required fire ratings should be established: fire rating of Intubatt product cannot exceed the rating of the substrate to which is installed within.
- Services and any relevant closer device (Intucollar, Sleeve, Strap, HP-Mastic, etc.) required to maintain the compartment line, should be suitable for use within Firetherm products. Sealant used should be of Firetherm origin only. Such sealants are traceable using Optifire identification.

1. Locate and review all relevant safety data sheets before work commences, these include safety data sheets for fire products and any other product relevant to the seal construction. 2. Ensure compatibility and suitability of all components contained within the proposed Intubatt seal. Also ensure the relevant number of layers of Intubatt has been selected to facilitate the requirement of the fire rating.
3. Remove any debris, dust, loose cement, etc. from surface and area relevant to seal construction.
4. Measure openings and transfer measurements of openings and service locations to the face of one or more Intubatt, keeping the number of cut pieces to a minimum and ensuring Intubatt can be compression fitted on at least two opposite sides, between either sufficiently fire rated substrates or non combustible services which are correctly supported.
5. Using a suitable and safe cutting implement, cut the pre marked Intubatt to enable installation around penetrants whilst keeping joints to a minimum. Ensure all cuts are tight to the penetrant and that batt to batt joints are tight across the compressed edge of the Intubatt thickness.
6. Coat all raw edges of Intubatt using Firetherm Intumastic Brush Grade or Intumastic and install in accordance to the correct substrate drawing (as supplied by Firetherm). Install pieces in a methodical order checking for continuity of joints, edges, penetrant edges and opening edges, as per instruction in Item 5.
7. Once Intubatt has been correctly located, point all exposed joints and edges of the seal using Intumastic to penetrants, cables, joints and covering any exposed mineral fibre.

**Patress Mount:** Firetherm Intubatt may also be installed as a surface mounted seal to Drywall and Blockwork openings. Basic requirements: Intubatt to be laid of on an even bed of Intumastic, minimum overlap to plasterboard ensured to be no less than 75 mm. Non-Combustible fixings with a minimum 25 mm head or suitable penny washer must be applied at maximum 250 mm centers, 15 – 65 mm from edge of Intubatt, minimum two per cut piece. All edges and raw fibres must be coated using Intumastic brush grade. All joints must be bonded using Intumastic or Intumastic Brush Grade. All services must be sealed using Intumastic. There is no requirement for mechanical fixing to locate into stud work on drywall partitions.

**Restricted Access:** If access is only available from a single side, the substrate opening should be coated using Intumastic brush grade, a further bead of Intumastic should be applied to the perimeter of the opening. All Intubatt joints and penetrant cut outs should be coated excessively using Intumastic only. This will ensure push out of mastic (which maybe tied only on the accessible side) should have filled all gaps/ cracks on the inaccessible side.

*For large openings over 1197 mm span using a single Intubatt, extra reinforcement will be required if not offered by non-combustible services.*

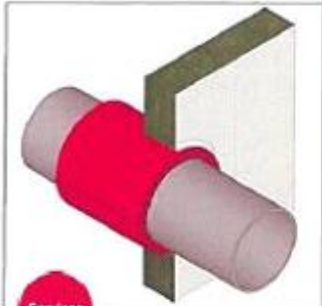
*For large openings over 1497 mm span using a double (Back to Back) Intubatt, extra reinforcement will be required if not offered by non-combustible services. Cavity walls must always be protected from both sides of the cavity or the cavity should be closed if the risk of fire is to both sides of the construction. Contact technical department for suitable application detail.*

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Suitability of the product and its usage to substrate type, service type and fire requirement must be confirmed before installation commences. A specific detail relevant to installation must be requested for other to be considered. All fire resisting products should be installed by a third party, accredited fire stopping contractor or competent person.

# Intusleeve



Services

## An intumescent closer device for combustible services.

### Description

A 140 to 300mm (dependent on requirement) deep steel sleeve that is positioned around combustible pipes to provide up to 4 hours fire protection. Designed specifically to provide a low cost solution for fire sealing combustible pipe penetrations whilst completely protecting the cavity within stud work walls.

Intusleeve is a perfect solution for angled pipes.

### Dimensions and Colour

Circular, diameters: 55 mm, 82 mm, 90 mm, 110 mm, 160 mm & 200 mm.

Standard length: 140 mm. Length may be increased to suit angled pipe requirements.

Colour: red

### Fire Testing

- Tested at Exava BM Trada to BS EN 1366-3 and BS 476 Pt 20-22



### Features

- Ultra-slim body design ensures easy installation in awkward situations and less obtrusive than externally fitted fire collars
- Fully tested at Exava BM TRADA to 2 hours integrity and insulation walls, 4 hours integrity and insulation when used within intucompound floor seals

### Applications

Used to seal combustible pipes as they pass through fire compartment walls and floors. In a fire, the intumescent lining within the metal sleeve expands and crushes the heat softened plastic pipe leaving a potential path for fire completely sealed.

### Typical Configuration Types

Combustible pipes, insulation types: rock fibre, glass fibre, phenolic, nitrile rubbers

Tested in floors and walls, including lightweight partitions

May also be used within Firetherm Intubat 1 and 2.

### Installation

1. Pull open Intusleeve and fit around pipe.
2. Push Intusleeve through compartment wall ensuring equal overhang to each side.
4. Close Intusleeve
5. Seal in place using Firetherm Intumastic or ADL sealant in gaps up to 20 mm. Larger openings may be sealed with Firetherm Intubat
6. Annular spaces up to 60 mm may be packed using a minimum 60 mm depth 64 kg rock fibre.

Length of sleeve is relative to the width of wall and should be specified when placing order

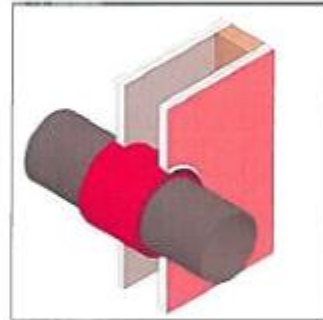
### Legislation

Building Regulations 2000 Approved Document B states that all plastic pipes over 40 mm should be provided with a proprietary sealing system which has been shown by tests to maintain the fire resistance of the wall, floor or cavity barrier. Firetherm Intusleeve complies with these requirements

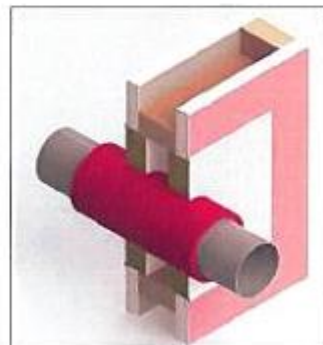
### Storage & Shelf Life

Intusleeve has a 50 year shelf life when stored in shaded, dry conditions between -50°C and +65°C.

### Typical Details



Intusleeve pipe penetration in dry lined wall



Intusleeve pipe penetration with Intubat

Firetherm Intumescent & Insulation Supplies Limited  
Unit F Acorn Industrial Park, Crayford Road, Crayford, Kent DA1 4FT  
Phone: 01322 551010 Fax: 01322 552727 Email: sales@firetherm.com www.firetherm.com

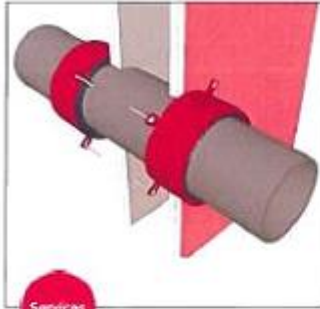
This data sheet offers guidance related to fire testing results and does not offer methodology of the installation of the product. Suitability of this product and its usage to substitute pipe, service type and fire requirement must be confirmed before installation commences. A specific detail relevant to installation must be requested. Firetherm recommend that all fire stopping product should be installed by a third party to obtain fire stopping contractor or competent person full application advice and methodology instructions should be requested before installation of the product commences. Standard terms and conditions apply to all lines.



# Intucollar

Up to  
**240**  
minutes

Intucollar  
up to  
**240**  
minutes



Services

**Used to seal plastic pipes as they pass through fire compartment walls and floors.**

**Description**

A metal shell produced in two hinged halves, lined with intumescent material, to be placed around combustible pipes and fixed to compartment walls and floors with all steel anchors (supplied) to provide up to 4 hours fire protection.

**Dimensions and Colour**

Standard sizes:  
55 mm, 82 mm, 110 mm, 160 mm and 200 mm. Other sizes available on request.  
Larger sizes to special order up to 355 mm  
Colour: red

**Fire testing**

- Tested at Exova Warrington to BS 476 Pt 20, up to 4 hours fire integrity and insulation on block/concrete
- Tested at Exova BM Trada to BS-EN 1366-3, up to 60 minutes integrity and insulation on drywall or 120 minutes in conjunction with Firetherm Intubatt, blockwork or floors



**Features**

- Ultra-slim flange and body design ensures easy installation in awkward situations
- Tested at Exova BM TRADA
- Simple single click clasp
- Next day availability on standard sizes
- Supplied with blockwork fixings
- 100 times minimum expansion of active product
- Water resistant
- Non-corrosive: inert product

**Applications**

Used to seal plastic (PVC-u, PVC, C-PVC, PP, PE, HDPE, PPR, Firetherm and ABS) pipes as they pass through fire compartment walls and floors. In a fire, the intumescent lining of the metal collar expands and crushes the heat softened plastic pipe leaving a potential path for fire completely sealed.

Tested in insulated/non insulated dry wall construction, blockwork walls, concrete floors and within Firetherm Intubatt.

**Installation**

1. For walls, a collar is required on both sides for floors use one on the underside only
2. Fit a collar around the plastic pipe and slide it up to the compartment wall or floor.
3. Close the collar around the pipe using the over centre catch.
4. Decide on the best position of the remote fixings bearing in mind site conditions. Mark and drill 6 mm holes to accept the all steel fixings.

Ensure all fixing brackets are utilised.

5. Tighten the fixings and test security of installation manually.

For dry wall applications (up to 60 minutes), Intucollars are tested using full thread dry-wall screws. Use a very low torque set with electric screwdrivers.

**Legislation**

Building Regulations 2000 Approved Document B states that all plastic pipes with an internal diameter over 40 mm should be provided with a proprietary sealing system which has been shown by tests to maintain the fire resistance of the wall, floor or cavity barrier. Firetherm Intucollar complies with these requirements.

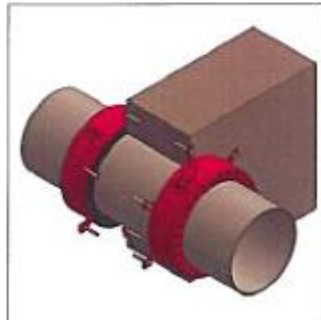
**Specification**

Install Firetherm Intucollar to seal around all plastic pipes. Design and installation to be fully in accordance with manufacturer's instructions.

**Typical Details**



Intucollar in timber floor



Intucollar in masonry wall

Firetherm Intumescent & Insulation Supplies Limited  
Unit F Acorn Industrial Park, Crayford Road, Crayford, Kent DA1 4FT  
Phone: 01322 551010 Fax: 01322 552727 Email: sales@firetherm.com www.firetherm.com



This data sheet offers guidance related to the fixing methods and does not offer methodology of the installation of the product. Full details of this product and its usage to substrate type, wall type and fire requirement must be confirmed before installation commences. A specific detail relevant to installation must be requested. Firetherm recommend that all fire stopping products should be installed by a third party 3rd party certified fire stopping contractor or competent person. Full application details and methodology instructions should be requested before installation of this product commences. Standard terms and conditions apply to all sales.

# Intusleeve Cable

Integrity up to **240** minutes

Insulation up to **120** minutes



Services

## A high pressure graphite manipulated intumescent closer for cable penetrations.

### Description

All Intusleeve will arrive preconfigured based upon requirements. The outer shell is steel lined with a high expansion intumescent and is specifically designed to provide a low cost solution for cables, conduits and combustible pipes and closing the cavity.

Lengths range from 140 mm minimum to 300 mm, but can be made to any length above 140 mm, dependent on requirement and timescales.

### Dimensions and Colour

Rectangular:  
204 mm x 60 mm, 110 mm x 54 mm,  
220 mm x 90 mm, 300 mm x 25 mm,  
225 mm x 25 mm.

Circular:  
50 mm to 160 mm diameter.

Standard length: 140 mm. Other sizes available to order on request.

Colour: standard colour is red with black foam smoke seal.

### Fire testing

- Tested at Exova BM Trada to BS EN 1366-3 and BS476 Pt 20-22 to 240 minutes Integrity and 120 minutes Insulation



### Features

- Ultra-slim body design ensures easy installation in awkward situations
- Fully tested at Exova BM TRADA to 2 hours integrity and insulation in walls
- 4 hours integrity and insulation 120 minutes when used within 100 mm Intucompound floor seals

### Applications

Intusleeve Cable management provides a tested fire solution to cables, cables within conduits, and combustible pipes passing through internal walls and floors. During a fire, the intumescent within the metal sleeve expands and crushes the heat softened combustible elements, leaving a potential path for fire completely sealed. Once installed within the substrate, the Intusleeve product allows the removal and installation of services, without the risk of damaging fire seals.

### Installation

1. Remove lid or pull open Intusleeve Cable and fit around cables or position within wall for future cable application. Replace lid.
2. Push Intusleeve through compartment wall ensuring equal overhang to each side.
4. Seal in place using Firetherm Intumastic or Intumastic ADL sealant in gaps up to 20 mm. Larger openings may be sealed with Firetherm Intubatt.
5. Annular spaces up to 60 mm may be packed using a minimum 60 mm depth 64 kg rock fibre.

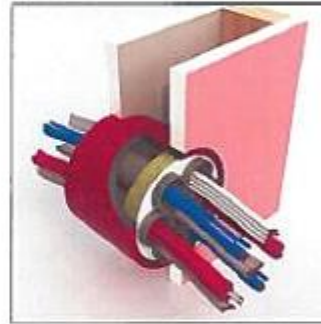
Length of sleeve is relative to the width of wall and should be specified when placing order.

220 x 90 mm sleeve requires a minimum 250 mm length of sleeve of other sizes minimum 140 mm length.

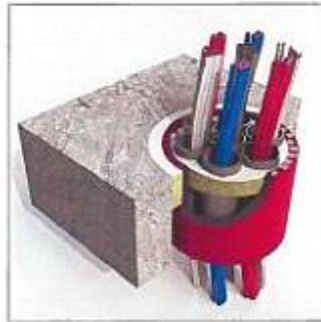
### Specification

Install Firetherm Intusleeve Cable to seal around all Cables. Design and installation to be fully in accordance with manufacturer's instructions.

### Typical Details



Intusleeve Cable in dry lined wall



Intusleeve Cable in concrete floor

Firetherm Intumescent & Insulation Supplies Limited  
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The data sheet offers guidance related to fire testing results and does not offer methodology of the installation of the product. Suitability of this product and its usage to substrate type, service type and fire requirements must be confirmed before installation commences. A specific detail relevant to installation must be requested. Firetherm recommends that all the existing product should be installed by a third party approved fire stopping contractor or a registered permit. Full application details and methodology instructions should be requested before installation of the product commences. Standard terms and conditions apply to all times.



# Intusleeve Duct

120 minutes

120 minutes



## An economical solution for fire sealing combustible ducting penetrations.

### Description

A 140 to 300 mm (dependent on requirement) deep steel sleeve that is positioned around the ductwork. The device is pre-lined with a high expansion intumescent and is designed specifically to provide a low cost solution for fire sealing combustible ducting penetrations whilst completely protecting the cavity within stud work walls. The device can be retro-fitted to existing ducting.

### Dimensions and Colour

Rectangular ducts: 204 x 60 mm, 110 x 54 mm, 225 x 25 mm, 220 x 90 mm, 300 x 25 mm  
50 to 160 mm diameters when using circular ducting  
Standard length: 140 mm. Other sizes available to order on request.  
Colour: red

### Fire Testing

- Tested at Exova BM Trada to BS EN 1366-3 and BS 476 Pt 20-22, 120 minutes EI



### Features

- Ultra-slim body design ensures easy installation in awkward situations
- Fully tested at BM TRADA to 2 hours integrity and insulation walls

### Applications

Used to seal plastic ventilation ducts as they pass through fire compartment walls. In a fire, the intumescent lining within the metal sleeve expands and crushes the heat softened plastic pipe leaving a potential path for fire completely sealed.

3-sided, soffit mounted version also available

### Installation

1. Open Intusleeve Duct and fit around duct. Replace lid. 3-sided option attaches directly to soffit through pre drilled holes.
2. Push Intusleeve through compartment wall ensuring equal overhang each side.
4. Seal in place using Firetherm Intumastic or ADL sealant in gaps up to 20 mm. Larger openings may be sealed with Firetherm Intubatt.
5. Annular spaces up to 60 mm may be packed using a minimum 60 mm depth 64 kg rock fibre.

Length of sleeve is relative to the width of wall and the seal. This should be specified when placing order.

220 x 90 mm duct requires a minimum 250 mm length of sleeve

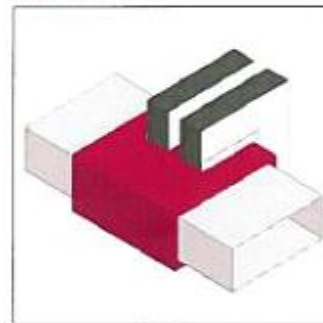
### Legislation

Building Regulations 2000 Approved Document B states that all plastic pipes over 40 mm should be provided with a proprietary sealing system which has been shown by tests to maintain the fire resistance of the wall. Firetherm Intusleeve complies with these requirements.

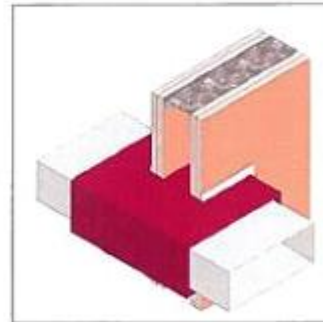
### Specification

Install Firetherm Intusleeves to seal around all plastic ducts. Design and installation to be fully in accordance with manufacturer's instructions. Available in both 3 and 4 sided versions to suit all applications.

### Typical Details



Intusleeve duct in Intubatt



Intusleeve duct in dry lined wall

Firetherm Intumescent & Insulation Supplies Limited  
Unit F Acorn Industrial Park, Crayford Road, Crayford, Kent DA1 4FT  
Phone: 01322 551010 Fax: 01322 552727 Email: sales@firetherm.com www.firetherm.com



The data sheet offers guidance aimed to increasing safety and does not alter methodology, or the application of the product. It is subject to any special conditions and its usage to substitute any manufacturer and the equipment must be certified before installation commences. A specific certificate of installation must be requested. Firetherm recommends that all fire stopping products should be installed by a third party or a qualified fire stopping contractor or competent person. Full application details and methodology variations should be requested before installation of the product commences. Standard terms and conditions apply to all sales.

# Spanatherm

Integrity  
up to  
**120**  
minutes

Insulation  
up to  
**90**  
minutes



Walls Floors

**Cost effective and efficient firestopping for slab edge and curtain walling, for static or movement joints.**

**Description**  
Spanatherm is a strong pre-engineered rock fibre movement-joint fire seal, that allows significant movement accommodation at the same time as providing fire integrity, insulation and an effective smoke seal.

Spanatherm is a dense fibrous system faced on both sides with foil to provide direct surface spread of flame and a vapour check barrier.

**Dimensions and Colour**  
Size: 1200 x 600 x 100 mm thick slabs. (Firetherm also offer a cut to size service for larger projects)  
Colour: foil faced both sides

**Fire Testing**  
Spanatherm has been rigorously tested to BS 476 Pts 20 and 22: 1987 at a UKAS accredited laboratory for up to two hours fire integrity and 90 minutes insulation

**Maximum Openings**  
Facade and internal movement and slab edge seals up to 550 mm (maximum gap width +/- 7.5% movement)

**Features**  

- Most economic overall system
- Up to 2 hours fire protection
- Economic fixings
- Vapour barrier
- Smoke barrier
- Acoustic seal

**Applications**  
Spanatherm is a dry fit system designed to be a cost effective and efficient method of firestopping static and movement joints for slab edge/curtain walling or vertical details

**Typical Service Types**  
None expected.  
Combustible pipework, steel pipework and cables can be accommodated. Please consult Firetherm Technical for detailed solutions

**Typical Installation**  

- Clean all surfaces to remove loose debris, dirt and grease.
- Carefully remove Spanatherm from its packaging.
- Measure the gap width of the opening to be sealed.

4. Cut the Spanatherm into strips lengthways to the width of opening plus approximately 10% (minimum 5 mm) to ensure a compressed joint.

5. Under compression, install the cut length of Spanatherm. Where the opening width exceeds 50 mm or the cladding system is flexible, edge clips or V-lock spikes will be required to provide sufficient support in relation to gap width.

The clip is fixed into the slab side edge of the floor slab. Clips/Spikes required: 3 per 1.2 m at 400 mm centres working from the centre line, minimum 2 per cut piece.

6. Butt join additional lengths of Spanatherm along the seal as required.

7. Seal adjoining edges of Spanatherm using suitable adhesive backed foil tape. 50 micron, 100 mm wide tape is recommended and is available from Firetherm.

- For any irregularities or discontinuities up to 55 mm (such as around mullions, etc.) Intumastic or Intumastic ADL may be used at a 1:1 ratio to complete the seal.
- When used vertically the smoke seal must be applied to both faces of the product.

NOTE: The integrity and insulation rating of this product is limited to the capability of the surrounding substrates, we do not permit the use of this product against combustible cladding

**Storage & Shelf Life**  
Spanatherm has a 50 year shelf life when stored in shaded, dry conditions between -50°C and +65°C.

**Typical Details**



Spanatherm



Close up of Spanatherm support bracket



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This data sheet offers guidance verified to fire testing results only. It does not alter the methodology of the installation of the product. Suitability of this product and its usage to substrate type, service type and fire requirement must be confirmed before installation commences. A specific detail requires a calculation to be requested. Firetherm recommends that all fire stopping work should only be installed by a third party certified for all types of concrete or composite joints. Full application details and methodology instructions should be requested before installation of the product commences. Standard terms and conditions apply to all lines.

# Intumastic HP

Integrity  
up to  
**240**  
minutes

Insulation  
up to  
**240**  
minutes



## A heat-reactive, intumescent acrylic fire barrier mastic for internal use around services.

### Description

An aqueous acrylic fire barrier mastic for internal use, containing inert fillers and graphite.

Maximum diameter 125 mm combustible pipe seals, up to 60 mm insulation wall thickness, 60 mm annular space around cables or large preformed slots in walls/floors forming cable tray/basket openings

### Dimensions and Colour

Tube size - 310 mm

Colour - grey

Tack free time 60 to 120 minutes depending on temperature/humidity.

### Fire Testing

- Tested at Exove BM Trade to BS EN 1366 Pt 3. 240 minutes fire integrity and insulation

### Typical Applied Depths

- 25 mm in openings 150% of combustible pipe/conduit size
- 25 to 50 mm within Firetherm Intubatt
- 25 mm direct within plasterboard annular spaces
- 30 mm within conduits
- 10-25 mm around all insulation types, up to 50 mm wall thickness

### Features

- Fully tested to four hours fire protection
- Low smoke and non-hazardous
- Tested within single skin partitions
- For use in both walls and floor

### Applications

An intumescent pressure exerting mastic used to fire seal combustible pipework up to 90 mm diameter and for sealing around cable trays, cables and within cast in plastic or steel conduits or around insulation whilst providing up to two hours fire protection

### Installation

Install Intumastic HP in full accordance to installation details provided by Firetherm.

Product will expand 52 times by volume. Reaction commences at 130°C.

1. Read the Intumastic HP safety data sheet instructions before starting work.

2. Ensure opening size corresponds to 150% of the pipe combustible size

3. Cut the end of the tube and trim the nozzle to size required.

4. Force Intumastic HP well into the joint ensuring the correct depth of seal, backing material and sides of the joint are well covered.

5. Tool off to a good finish using a wet trowel.

### Coverage

10 mm wide seal - 3.25 m approx.

15 mm wide seal - 1.35 m approx.

20 mm wide seal - 0.78 m approx.

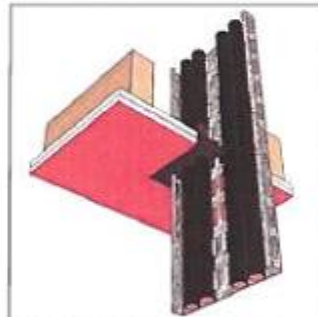
Or use formula:

$$\frac{\text{Gap width mm} \times \text{sealant depth mm} \times \text{linear metres}}{310 \text{ ml}}$$

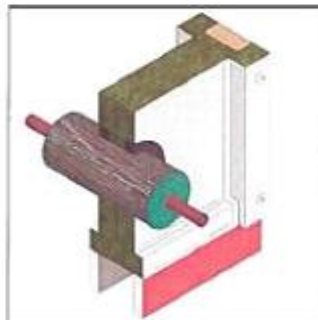
For example:

$$\frac{10 \text{ mm gap} \times 10 \text{ mm} \times 100 \text{ metre run}}{310 \text{ ml}} = 32.25 \text{ tubes}$$

### Typical Details



Dry lined ceiling with Intumastic cable tray



Phenolic insulated pipe and Intumastic HP in joint

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Unit F Acorn Industrial Park, Crayford Road, Crayford, Kent DA1 4FT

Phone: 01322 551010 Fax: 01322 552727 Email: sales@firetherm.com WWW: firetherm.com

This data sheet only provides guidance related to fire testing results and does not alter methodology of the installation of the product. Suitability of the product and its usage to particular type, service type and fire risk element must be confirmed before installation commences. A specific order request to distributor must be requested. Firetherm recommends that all fire stopping work must be done in a controlled fire stopping workshop or concrete plant. Full application details and methodology instructions (MSA) are requested before installation of the product commences. Standard terms and conditions apply at all times.



# Intumastic

Optifire  
Traceable

Integrity  
up to  
**240**  
minutes

Insulation  
up to  
**240**  
minutes



## A fire rated mastic for internal use, containing acrylic emulsion, inert fillers and fungicide.

**Description**  
Suitable for dry internal use only.  
Joint widths 0 to 3.5 mm linear, 30 to 150 mm movement details.  
Depth to width ratios 1:1 walls and floors, 2:1 split wall seals.  
Standard colours are white and grey. Can be over-painted using acrylic paints (must be fully cured before over-coating).  
Tack free time 15 to 60 minutes, depending on temperature/humidity.

**Available Sizes**  
310 ml cartridge  
600 ml foil pack  
Also available in 20 litre pour or spray grade for use with Intumastic Soft Joint.

- Fire Testing**
- Tested at Exova BM Trade to BS EN 1366-3/4
  - Tested at Exova Warrington Fire to BS476 Pt 22
  - Third party accredited by Exova Warrington Fire, certificate number CF 578



- Maximum Openings**
- Maximum wall opening 35 mm x infinite length linear gap
  - Maximum floor opening 35 mm x infinite length linear gap
  - Maximum opening in movement seal 240 mm x infinite length

- Features**
- Tolerant to building movement
  - May be over painted
  - Fully tested for up to 240 minutes integrity and insulation
  - Optifire identification
  - Tools off easily with water
  - Air pressure tested up to 2000 Pa

**Applications**  
Firetherm Intumescent may be used to fire seal linear joints between substrates in compartment locations. Intumastic may also be used in movement joints and offers a movement capability of up to 30%.

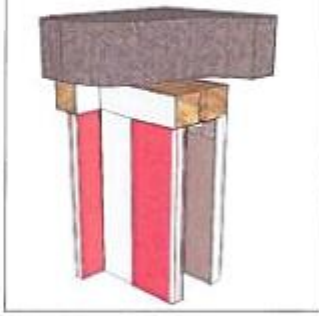
- Typical Scenarios**
- Fire and smoke seals
  - Linear joint seals
  - Floor movement seals
  - Head of wall seals
  - Intubatt bonding and pointing
- May also be used for fire and smoke sealing around cables, steel pipes, copper pipes, cable trays, combustible pipes, dampers and ducting.

**Installation**  
1:1 ratio wall 240 minutes integrity, 240 minutes insulation  
1:1 ratio floor 240 minutes integrity, 240 minutes insulation  
3mm over 100mm Firetherm Backer 240 minutes integrity, 240 minutes insulation, 30% movement.  
10mm angled fillet to intubatt edges or full depth plus fillet around services.

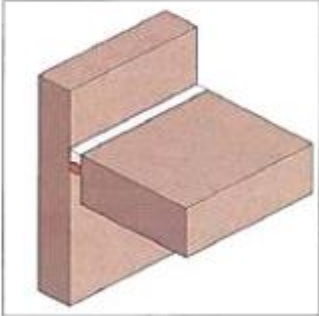
**Coverage**  
10 mm wide seal - 3.25 m approx.  
15 mm wide seal - 1.35 m approx.  
20 mm wide seal - 0.78 m approx.  
Or use formula:  
$$\frac{\text{Gap width mm} \times \text{sealant depth mm} \times \text{linear metres}}{310 \text{ ml}}$$

For example:  
$$\frac{10 \text{ mm gap} \times 10 \text{ mm} \times 100 \text{ metre run}}{310 \text{ ml}} = 32.25 \text{ tubes}$$

### Typical Details



Linear mastic movement seal



Typical floor to wall mastic seal



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This data sheet does not constitute a contract and does not alter the methodology of the application of the product. Suitability of this product and its usage to substrate type, service type and fire requirement must be confirmed before installation commences. A specific detail relevant to installation must be requested. Firetherm recommend that all fire stopping systems should be installed by a third party accredited for stopping. Details for 'Temporary Access' full application details and methodology instructions should be requested before installation of the product commences. Standard terms and conditions apply to all items.

# Electro Pad

Integrity  
up to  
**120**  
minutes

Integrity  
up to  
**120**  
minutes



Services

**Provides fire protection within electrical socket boxes in fire compartment walls.**

**Description**

A pressure exerting graphite manipulated extruded rubber pad. Electropad is simply bonded into position at the rear of the socket box, only reacting in the event of a fire.

**Sizes and Packaging**

Sizes: 70 x 60 x 4 mm or 130 x 60 x 4 mm  
Colour: black/silver  
Density: 1567 kg/m<sup>3</sup>

**Fire Testing**

- Tested at Exova BM Trade to BS EN 1366-3 and BS 476 Pt 22

**Features**

- Up to 2 hours fire protection
- Acoustic sealing
- Choice of installation methods
- Simple to install
- Suitable for most dry wall applications

**Typical Service Types**

- Metal electrical socket boxes
- Within GIB partitions, timber or steel stud construction
- Power and light sockets within compartment walls

**Typical Installation**

1 x Electropad = 120 minutes integrity and insulation (limited by wall construction).  
Typically adhered into position using Firetherm Intumastic to rear of Electropad.

**Typical Details**



Socket box double skin wall



Socket box single skin wall

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Phone: 01322 551010 Fax: 01322 552727 Email: sales@firetherm.com www.firetherm.com



This data sheet offers guidance related to fire testing results and does not alter the fire rating of the insulation of the product. Suitability of this product and its usage to suit the fire service type and fire requirement must be confirmed before installation commences. A specific detail relevant to installation must be requested. Firetherm recommend that all fire stopping products should be installed by a third party accredited fire stopping contractor or competent person. Full application details and methodology instructions should be requested before installation of the product commences. Standard terms and conditions apply to all lines.





## PRE-CONSTRUCTION INFORMATION

**PROJECT NO:**  
22411

**DATE:**  
21/05/2022

**AUTHOR:**  
HC

**PROJECT:** Boiler and Heating Distribution

**ADDRESS:** Lime Academy Hornbeam – Brookfield House, Woodford Green, Essex,  
IG8 9PY

**CLIENT:** Lime Academy

**LEAK INVESTIGATION  
SERVICES**

**EXPERT CONSULTANCY  
SERVICES**

**BUILDING SURVEYING  
SERVICES**

## Document Control Sheet

Project Title: Brookfield House Campus – Heating Project

Report Title: Pre-Construction Information

Revision: 01

Status: Final

Control Date:

## Record of Issue

Issue	Status	Author	Date	Check	Date	Authorised	Date
01	Final	HC	20/05/2022	JH	21/05	SL	23/5

## Distribution

Organisation	Contact	Copies
Client – Lime Academy	Laura Fisher	one
Contractor -	TBC	one
Project Managers	- Project Manager	One (file copy)
Principal Designers	- Principal Designer	One (file copy)



### Pre-Construction Health & Safety Information Pack

The contractor should be aware and understand the CDM 2015 Regulations and the associated HSE Guidance on the Regulations (L153) – Managing Health and Safety in Construction.

This project IS NOT notifiable to the Health and Safety Executive and therefore, under Regulation 6 of CDM 2015.

The purpose of this document is to provide information to Contractors on the Health and Safety and welfare matters to be taken into account when planning for the site works detailed in the specification document and on the drawings. The Principal Contractor shall use and develop this information as part of his duties and responsibilities under the CDM Regulations.

This document should provide specific information obtained from both the Client and Designers during the course of the design and early planning phases of the project, so that Health and Safety issues are identified and communicated effectively.

The absence of reference in this Pre-Construction Information Pack to a hazard does not mean that such a hazard does not exist or may not arise. Any 'Method of Working' described in the Pre-Construction Health and Safety Information Pack, as prepared by the Principal Designer, may be varied by the Contractor as long as he provides an acceptable alternative method to the Principal Designer prior to works commencing.

### **Construction Phase Health & Safety Plan**

The prospective Contractor shall review the information included or referred to in this document and provide the relevant information in his Construction Phase Plan.

The principal aim of the Construction Phase Plan is to record Health / Safety arrangements for the management of construction operations together with monitoring procedures for compliance with the relevant statutory provisions.

The Construction Phase Health & Safety Plan must contain reference to those matters required in Appendix 3 of the HSE's Managing Health and Safety in Construction guidance document (L153).

Ultimately, the Construction Phase Plan will be developed by the Principal Contractor into the Health & Safety File.

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## APPENDICES

Appendix A Designer's Risk Assessment

Appendix B Drawings



## .1. INTRODUCTION

## .2. Location

**Site Address:** Lime Academy Hornbeam, Brookfield House, Alders Avenue, Woodford Green, Essex IG8 9PY

### **Description of existing site character:**

The school building is located to the South of the school grounds. The remainder of the school site is tarmac playground and parking, and grassed areas.

### **General Construction of building(s):**

The school consists of a single storey building constructed with cavity walls and red facing brickwork. Windows and doors consist of metal and PVC-u double glazed units, and the skylights are single layered PVC-u.

## .3. Nature of construction work to be carried out

The purpose of this project is to replace the boilers and associated equipment. This includes :

- Undertake asbestos survey, and removal as required;
- Removal of boilers and associated plant ;
- Removal of Circulating Pumps;
- Removal of hot water generators;
- Removal of heating pressurisation unit;
- Removal of expansion vessels;
- Removal of Complete boiler/water heater flue installation (by specialists Chimney & Canopy Systems Limited)
- Removal of Complete controls installation, in the plantroom, including two (2) control panels (by specialists Control Panel Services Limited);
- Removal of Complete low temperature hot water installation, in the plantroom, including boiler shunt circuit, North zone variable temperature circuit, South zone variable temperature circuit, classroom ventilation constant temperature circuit, VSD constant temperature circuit and LPHW constant temperature circuit; including all circulating pumps, valves, gauges, and associated plant;

#### .4. Timescale for completion of the works

Date of Commencement: July 2022

Date of Completion: TBC

Anticipated project duration: 12 Weeks

The sequence and/or phasing of work is to be discussed and agreed with the Project Manager/Contract Administrator and the Principal Designer prior to commencement.

## Parties to the Project

<b>Client:</b>	Lime Trust	<b>Contact:</b> <b>Tel:</b> <b>Mobile:</b> <b>Email:</b>	Laura Fisher   Laura.fisher@limetrust.org
<b>Designer / Contract administrator:</b>	RAM Building Consultancy PO Box 1567 Bedford MK41 5BH	<b>Contact:</b> <b>Tel:</b> <b>Mobile:</b> <b>Email:</b>	Harry Chater 0844 335 1822  harrychater@ramconsultancy.co.uk
<b>Principal Designer:</b>	RAM Building Consultancy PO Box 1567 Bedford MK41 5BH	<b>Contact:</b> <b>Tel:</b> <b>Mobile:</b> <b>Email:</b>	Harry Chater 0844 335 1822  harrychater@ramconsultancy.co.uk
<b>Principal Contractor:</b>	TBC	<b>Contact:</b> <b>Tel:</b> <b>Mobile:</b> <b>Email:</b>	

## **.5. CLIENTS CONSIDERATION AND MANAGEMENT REQUIREMENTS**

### **.6. Statement of the Client's Health and Safety Policy**

It is the policy and commitment of the Client that the safety of its Employees, Customers and Suppliers will not be compromised.

Consequently, all construction related work commissioned by the Client will have, as its highest priority, the consideration of the health, safety and welfare of all who will carry out, use and maintain the works.

The Client will therefore select professional design and construction service providers who will put into practice this philosophy to produce and manage a scheme which contains the minimum of hazards and risks, and who will properly control those risks that remain.

A Health and Safety File will be prepared on completion of the works. It will be the Contractor's responsibility to ensure that all hazards identified during the works and any known issues are recorded and issued to the Principal Designer for inclusion within the Health and Safety File.

### **.7. Communication and liaison between client and others**

The Principal Contractor is to detail how he will ensure co-operation between contractors on site for health and safety purposes. The details shall include how information will be passed and enforced between sub-contractors and visiting personnel (i.e. Client, designers, Principal Designer, etc.).

The Principal Contractor is to be responsible for examining this document and all other information provided, either as data on the existing environment and/or conditions, or as requirements for the finished works. The examination shall be for the purpose (amongst others) of establishing that:

- a) the works can be constructed; and
- b) subsequently that where applicable all elements of the works (fittings, fixtures, installations and even landscaping) can in all respects be maintained, altered, adapted and demolished without risk to the health or safety of any person.

The Principal Contractor shall, where required, design and construct all parts of the works to achieve the above objectives, taking full responsibility for elements and activities designed and/or constructed by subcontractors or specialist designers.

From appointment of the Principal Contractor until completion of works, regular meetings shall be held, attended by the Client, Project Manager and the Principal Contractor, together with any other parties believes should be present.

The Principal Contractor shall inform the Project Manager if (at the earliest opportunity) it becomes apparent that any proposals of any party in connection with the works could present risk to the health or safety of workers undertaking the construction or maintenance, or that of any end user.



From appointment of the Principal Contractor until completion of the works on the site, the Principal Contractor shall provide a regular written report to the Project Manager. The report shall include, amongst other information, details of works completed since the previous report, work proposed for the next period, status of the design of each element (where required), any implications for health and safety presented by the designs in their current form, and details of any accidents or near misses on the site.

At the Pre-Construction Contract, meeting arrangements for the exchange of design information between the client, designers, Principal Designer, Principal Contractor and sub-contractors shall be agreed.

## **.8. Security of the site**

Security arrangements shall be agreed between all parties prior to commencement of the works. A compound area will need to be fenced out and secured to prevent conflict between the Contractor's work materials (including welfare facilities, new materials and waste) and the general public (vehicles and pedestrians).

The Principal Contractor will be responsible for the security of the work area, ensure no unauthorised persons enter and that the area (including compound) is securely locked when the area is not occupied. Access to the site 'working areas' shall be restricted to 'authorised persons' that must be explicitly authorised, individually or collectively by the Principal Contractor.

## **.9. Welfare Provision**

Site welfare facilities must be established before works commence and approved by the Principal Designer.

Welfare arrangements shall be provided and maintained in a clean and tidy condition by the Principal Contractor, as required by the Construction (Design and Management) Regulations 2015. The Principal Contractor is to liaise with the Client (or representative) regarding the welfare facilities and their location (contractor to provide a location plan with the Construction Phase Health & Safety Plan). A clean supply of drinking water, hot washing water, hand drying facilities, toilet and first aid facilities must be provided by the Principal Contractor for the use of all operatives on the site.

The Contractor must include in the Construction Phase Health & Safety Plan details of First Aid facilities and locations.

## **.10. Site hoarding requirements**

The Contractor will be responsible for security of the designated work area. The Contractor shall provide and maintain all necessary signage, plus any necessary additional barriers, to segregate his working area(s) from third parties.

At the end of each day the Contractor shall ensure that the site is secured as appropriate and that no ladders etc. are left in a position that would allow unauthorised persons access to any high-risk areas within the site.

## **.11. Site transport arrangements / vehicle movement restrictions**

The Contractor's method (including access, parking, storage, deliveries, etc.) must be agreed with the Client, Project Manager and the Principal Designer. The Principal Contractor is to include within the Construction Phase Health & Safety Plan method statements and risk assessments for the storage of materials and vehicular traffic entering and leaving site. This should include details on how materials are to be offloaded and distributed. Method Statements and Risk Assessments should also be included for manual handling where mechanical means is not envisaged.

Any site compound and contractors waste skip storage area within the site must be agreed with the Project Manager and Principal Designer. If the site compound entrance is limited and there is only room for one vehicle at a time, then the access road to the compound cannot accept waiting vehicles.

A traffic management system will need to be in place to ensure access roads are kept clear and any waiting traffic is not stationed on the adjacent roads. This will also be the case for all deliveries in which there should be a strategy developed to cause the least disruption to site users and emergency services. Normal management of the site access regarding road cleaning will be needed. A banksman will be required for both entry and exit to the site.

The detail arrangements for site access and location for site compound and welfare facilities will be agreed prior to commencement of the contract.

## **.12. Client permit to work systems**

The Client expects that a permit to work system shall be implemented for all particularly hazardous operations on site. Works requiring permits to be in place will include, but are not restricted to:

- Hot Works (i.e. work which involves, or may result in, an open flame, the production of sparks, or other potential sources of ignition);
- Works in close proximity to HV electricity cables;
- Works in close proximity to gas mains;
- Works in confined spaces;
- Use of 240 volts.

The Principal Contractor shall put in place and manage such systems. Any activities requiring a PTW must be detailed fully within the Construction Phase Health and Safety Plan.

## **.13. Fire precautions, emergency procedures and Means of Escape**

The Principal Contractor is to devise an adequately detailed emergency plan and ensure that it is incorporated within the Construction Phase Health and Safety Plan and posted on the site notice board.

The following elements should always be included;

- Training and instruction of all staff and operatives
- Induction of visitors
- Location of assembly point
- Instruction of what to do in the event of a fire

- Identification of firefighting equipment from high risk areas
- Special arrangements for evacuation from high risk areas
- Firefighting training for those carrying out high risk works
- Method of maintaining of all effected existing fire escapes, temporary signage, etc.

The Contractor shall ensure that sufficient qualified first aiders and/or appointed persons are available at all times. All contractors, sub-contractors and visitors shall be made aware of the identity of these people. Suitable means of ensuring that first aiders and appointed persons can be readily identified include displaying their names on the site notice board and requiring them to wear suitable labels on their hard hats.

The Contractor shall keep records of all accidents and near misses that occur on site, including copies of any forms sent by contractors to the HSE under RIDDOR. All major occurrences shall be notified to the CDM co-ordinator as soon as possible, and a copy of all accidents / near miss records shall be included in the Contractor's regular progress reports.

#### **.14. Activities on or adjacent to the site during the course of the works**

Construction activities on adjacent sites during the course of this contract are not known at the time of tender. However, it is envisaged that routine maintenance works of the hospital grounds will be ongoing throughout the contract period.

#### **.15. 'No-go' areas or other authorisation requirements**

Areas to be identified in site induction. No known confined spaces.

#### **.16. Operatives Training**

The Principal Contractor is to satisfy himself that all machine operatives have passed CITB Construction Skills Health and Safety Test (obtaining a Construction Skills Certification Scheme [CSCS] card) at the relevant level for the activity in hand) or equivalent training prior to them starting work on site.

#### **.17. Smoking Restrictions**

No smoking will be permitted in any site accommodation or in any area of work.

#### **.18. Legal Enforcement**

The Principal Contractor is to notify the Principal Designer of any legal enforcements placed upon them during the contract period.

#### **.19. COSHH**

The Principal Contractor is to send a copy of their assessments under COSHH Regulations 'Control of Substances Hazardous to Health Regulations 2002' to the Principal Designer. In addition, the Principal Contractor shall inform the Principal Designer if any material or substance to be used is listed under the

'Approved Supply List' or 'Approved Carriage List' of The Chemicals (Hazard, Information and Packaging for Supply) (Amendment) Regulations 2002, or is comparable in hazard.

COSHH Assessments and material safety data sheets are to be included with the notification. The Principal Contractor shall notify the Principal Designer of any accident or occurrence on site that involves any employee in medical treatment or time off.

Any notification to the Health and Safety Inspectorate under the 'Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2002' shall be copied to the Principal Designer immediately.

## **.20. ENVIRONMENTAL RESTRICTIONS AND EXISTING ON-SITE HAZARDS**

### **.21. Boundaries and access**

The Principal Contractor shall be responsible for setting out the site access and egress, and trafficking routes within the contract area. These works should be carried out in accordance with HS(G) 144 – ‘The Safe Use of Vehicles on Construction Sites’.

Access for the site personnel, deliveries and parking must be agreed with the Project Manager / Contract Administrator. Arrangements must also be put in place to ensure that, as far as reasonably possible, the hospital and field users should be subject only to minor inconveniences. As previously stated, a plan must be provided within the Construction Phase Health & Safety Plan outlining these arrangements.

### **.22. Proximity of works to Client’s staff and members of the public**

The Principal Contractor is to maintain adequate fencing to its compound and precautions to prevent entry and injury by others in accordance with HSE publication HS(G)151 ‘Protecting the Public – your next move’, and its recommendations therein are expected to be adopted.

The Principal Contractor is to agree and confirm working hours (subject to Local Authority restrictions) with the Employer’s Agent / Project Manager / Contract Administrator / Client’s Representative.

The Principal Contractor shall, at all times, maintain safe use of the internal loop road by the public. Traffic management systems shall be put in place accordingly.

### **.23. Ground conditions / Underground Services / Watercourses**

Not applicable.

### **.24. Asbestos**

A Refurbishment/Demolition Survey will be carried out. The results of the survey will be forwarded prior to works commencing. No works will be carried out without the results being received.

Should any contractor encounter materials the identity of which is uncertain, he is to cease work concerning those materials immediately and refer to the Project/Site Manager for guidance. An assessment will be carried out on the likely exposure to persons and the extent of the substance. Analysis of the material by an accredited UKAS laboratory and use of a licensed removal contractor will form part of the assessment.

### **.25. Working at height / safe access and egress**

The provision and use of ladders, working platforms, etc. to work at height must comply with the requirements of the Working at Height Regulations 2005.

Provision of safe access and egress to / from the place of work for persons and materials, including provision for means of escape, must be agreed with the Principal Designer and Project Manager / Contract Administrator.

All temporary access / working platforms / mobile towers / suspended access equipment will be risk assessed as to suitability in compliance with The Work at Height Regulations 2005. All scaffolds will be erected to comply with the Construction (Design and Management) Regulations 2015 and BS EN 12811-1 (which requires scaffoldings to be designed unless they fall within the criteria for a scaffold built to NASC TG20. BS 5973 has been withdrawn by British Standards but is still currently accepted by HSE as an acceptable standard). Method Statements for scaffolding will be required prior to commencement of work; this will detail description of scaffold to be provided, any exclusion zones at ground level and measures to deter children and others from climbing on to the scaffold.

## **.26. Falls**

Measures to prevent falls of persons and / or materials from height due to unstable platforms, overloading with materials, etc., must be identified within the Construction Phase Plan.

## **.27. Excavations**

Not applicable.

## **.28. Fire Risk**

The Principal Contractor is to maintain a clear management regime to reduce the risk of fire associated with the build-up of rubbish, smoking in unauthorised areas of the site and electrical, welding and grinding work.

## **.29. Stability of Structures**

Not applicable.

## **.30. Traffic Management**

The Principal Contractor is to include within the Construction Phase Health & Safety Plan details (using graphics where necessary to aid understanding) of:

- Vehicle site access and egress and procedures to reduce the risk of accidents to other vehicles, pedestrians and users of the site;
- Pedestrian site access points and pedestrian routes including means of segregation from site vehicles;
- Traffic and pedestrian management including – details of warning signs (to include works site signs; construction site ‘Keep Out’ signs; pedestrian redirection signs; site entrance signs; banksman at entrance signs), barriers, implementation and maintenance of traffic management,
- Site Deliveries – restrictions, unloading, storage and waste removal;
- Welfare provision, site compound and parking facilities;

- Signage to be displayed both on and off site;
- How materials are to be off loaded and distributed. Should mechanical means be envisaged then management procedures should be included of driver and equipment safety and training;
- Measures specified for keeping the roads clean and free from mud/debris and dirt; and
- Precautions to be taken when entering or leaving the site to avoid causing accidents to pedestrians and road users.

### **.31. Dust**

The Principal Contractor should take all necessary steps to prevent any nuisances being caused by dust.

### **.32. Noise**

The Principal Contractor should take all necessary steps to prevent any nuisances being caused by noise. Where noisy plant and equipment is to be used consideration must be given to controlling this noise. The Control of Noise (Codes of Practice for Construction and Open Sites) (England) Order 2002 must be consulted.

### **.33. Contamination / Biological**

The site is not known to be contaminated. However, good housekeeping is essential together with good hygiene. Details of welfare facilities are to be included within the Construction Phase Health & Safety Plan.

### **.34. Manual Handling**

Method Statements and Risk Assessments in respect of manual handling are to be provided by the Principal Contractor.

All materials to be used should be handled in accordance with the Manual Handling Operation Regulations 1992, with mechanical handling of materials used where possible. The Principal Contractor is also to be aware of the HSE Publication HS(G)149 "Backs for the Future", and its contents followed.

Where reasonably practicable, as the Contractor will ensure all loads over 25 kg (20 kg for repetitive work) will be only handled by a suitable mechanical lifting device, i.e. during installation of services equipment.

### **.35. Operational Dermatitis**

Not applicable.

### **.36. Crane / hoist Lifting Operations**

Not applicable.

### **.37. Piling**

Not applicable.

### **.38. Cast in situ Concrete**

Not applicable.

### **.39. Pre-cast Concrete units and flooring**

Not applicable.

### **.40. Biological Organisms:**

Not applicable.

### **.41. Lead/lead paint:**

Any applications where lead or lead compounds have been utilised and are to be removed as part of the demolition stage must be approached with due regard to the regulations covering the protection of people and the environment.

### **.42. Vermin:**

Not applicable.

### **.43. Rivers:**

Not applicable.

### **.44. Occupied Areas**

The existing buildings will be in use at the time of these works. All existing pedestrian, vehicular and fire escape routes will be maintained.

### **.45. Window / Door installation & Glazing**

Not applicable.

### **.46. Stairwells and related work**

Not applicable.

### **.47. Carpentry**

All wood working and processing operations must be undertaken in such a way that the generation of wood dust is controlled and not allowed to spread where it may affect the individual doing the work or others close by.

### **.48. Decoration**



All decorating and related operations must take account of the relevant COSHH information for the products being used.

#### **.49. Roofing**

Not applicable.

#### **.50. Protecting the Public**

All necessary precautions will be taken to ensure the protection of the public is of the utmost priority throughout the duration of the works. Any work activities that may encroach or are located adjacent to public areas will be properly planned and monitored at all times.

#### **.51. Other Construction Works**

Details of all other construction operations on site to be obtained before commencement including a description and location of the work(s), and the likely impact on the project under consideration with a contingency plan agreed beforehand.

#### **.52. Excavations for foundations or sewers**

Not applicable.

#### **.53. Weil's Disease**

Not applicable.

#### **.54. Reducing noise and vibration**

Where possible any breaking out or excavating will be carried out by machine with operatives a safe distance away from the work area.

Any hand tools used will be assessed for noise and vibration and the assessments controls followed.

#### **.55. Safety Hazards – Proximity of works to mature trees**

Not applicable.

#### **.56. SIGNIFICANT DESIGN AND CONSTRUCTION HAZARDS**

#### **.57. Design Assumptions and control measures**

Refer to Designers Risk Assessment included in Appendix A.

## **.58. Arrangements for the co-ordination of ongoing design work and design changes**

The Principal Contractor must provide a systematic approach for the considerations of health, safety and environmental issues as an integral part of the design process at all stages of the construction project.

The Principal Designer must be informed of, and be involved in, all proposed design work and design changes during the construction period.

All health and safety issues during the construction period are to be discussed at the progress meetings with information recorded on a CDM Risk Register. The CDM Risk Register is to be created and managed by the Principal Contractor, with issues to the Client, Principal Designer and Project Manager / Contract Administrator.

## **.59. Information of the significant health and safety risks identified during design**

The Principal Contractor's attention is particularly drawn to Section 3 which contains details of both identified 'safety hazards' and 'health hazards' and the Designers Risk Assessment sheets.

Risk Assessments have been undertaken in accordance with the Construction Design and Management Regulations (2015) and a copy is contained in **Appendix A**. Included within the Risk Assessment are significant hazards that could not be substantially reduced or avoided by the design and are to be considered within the Construction Phase Health and Safety Plan.

## **.60. Materials Requiring Particular Precautions**

Only those construction materials intended for use on this project, which are considered to present an exceptional or unusual risk, are listed overleaf. Materials in common use for which COSHH Assessments are readily available are not listed.

- Cement based products;
- Bitumen products;
- Solvent based paints, stains and adhesives;
- Diesel fuel and lubrication oil for use in mechanical plant;
- Stone fines (associated dust creation and dispersion); and
- Herbicides.

The Principal Contractor's attention is drawn to the Control of Substances Hazardous to Health (COSHH) Regulations 2002. If the Contractor is aware of additional hazardous substances that will be used during the works then these must be added to the above list.

The Principal Contractor has a duty to obtain manufacturer's data sheets for any of the above materials, or those specified in the contract documents, and is to provide Risk Assessments and Method Statements

based on any warnings or hazards specified therein for the benefit of persons carrying out the work and subsequent users of the premises.

## **.61. CONSTRUCTION PHASE HEALTH AND SAFETY PLAN**

**1.1.** To be prepared by the Principal Contractor in accordance with Regulations 12, 13 and 14, prior to the commencement of the construction works. The format should follow the topics listed in Appendix 3 of the HSE's Managing Health and Safety in Construction guidance document (L153).

- Description of the Project (Key dates, parties to the project)
- Management of the Work (Site rules, security, site induction, welfare, risk assessments, liaison between parties, etc.)
- Arrangements for controlling significant site risks (Safety & Health Risks outlined in Section 3.0)

**1.2.** Information requested within Sections 2, 3 and 4 of this document is to be provided within the Construction Phase Health and Safety Plan, including:

- Method of Communication and liaison;
- Securing of the site;
- Welfare Facility provision (including location plan);
- Details of First Aid facilities and locations;
- Site transport arrangements / vehicle movement restrictions (including plan showing access, parking, cabins, etc.);
- Delivery and storage arrangements (including location plan);
- Traffic management system/plan (including all information outlined in paragraph 3.8);
- Works requiring permit to work systems;
- Detailed Emergency Plan (including site Fire Action Plan);
- COSHH Assessments and material safety data sheets; and
- Risk assessments and method statements for work activities.

**1.3.** Risk assessments are to be undertaken and method statements produced as required by legislation. Copies of method statements for any operations that could affect other occupiers are to be provided to the Project Manager and the Principal Designer sufficiently advance of the planned date of execution to allow for comments to be made.

## .62. HEALTH AND SAFETY FILE INFORMATION

- 1.4. The Health & Safety File is prepared under Regulation 12. The information provided in this document should be relevant to any future construction work and should be proportionate to the risks likely to be involved. The completed H&S File is required to be available for use by the Employer no later than Practical Completion.

Information Required	Information Provider	When Required
A brief description of the work carried out	Designer	Practical Completion
Residual hazards and how they have been dealt with (for example surveys or other information concerning asbestos; contaminated land; water bearing strata; buried services, Japanese Knotweed, etc.)	Principal Contractor & Designer	Practical Completion
Key structural principles (for example, bracing, sources of substantial stored energy – including pre or post-tensioned members) and safe working loads for floors and roofs particularly where these may preclude placing scaffolding or heavy machinery there;	Designer	Practical Completion
Hazardous materials used (for example lead paint; pesticides; special coatings which should not be burnt off etc.)	Principal Contractor & Designer	Prior to issue of Pre-Construction Plan
Information regarding the removal or dismantling of installed plant and equipment (for example and special arrangements for lifting, order or other special instructions for dismantling etc.	Principal Contractor & Designer	Practical Completion
Health & Safety information about equipment provided for cleaning or maintaining the structure	Principal Contractor	Practical Completion
The nature, location and markings of significant services, including underground cables; gas supply equipment; fire-fighting services etc.;	Principal Contractor & Designer	Practical Completion
Information and as-built drawings of the structure its plant and equipment (for example, the means of safe access to and from service voids, fire doors and compartmentalisation)	Principal Contractor & Designer	Practical Completion

- 1.5.** The Principal Contractor is required to prepare information for the Health and Safety File in a format as agreed with the Principal Designer, including information from sub-contractors.
- 1.6.** The Principal Contractor is required to provide information in hard copy and electronic format. Electronic format drawings, documents, etc, should be saved in either PDF or DWG format as well as the format that they were originally created in.
- 1.7.** The final version of information for the Health and Safety File is to be submitted to the Principal Designer one week before the anticipated date for Practical Completion of the works, unless highlighted otherwise.
- 1.8.** The Principal Designer will prepare the master version of the Health and Safety File (paper copy) incorporating information from the Principal Contractor as well as from the Client and design team. The Health and Safety File is to be handed over to the Client following Practical Completion.

## DECLARATION BY THE PRINCIPAL DESIGNER

The above Pre-construction Health and Safety Information Pack has been prepared on the basis of the information provided by the designer(s) working on the project. The designer(s) is/are aware of the requirements of the CDM Regulations 2015 and of the need to follow the hierarchy of risk control in managing hazards and reducing or eliminating risk.

Signed:

Name: Harry Chater


(Acting in the capacity of Principal Designer)

For and on behalf of: RAM Building Consulting Ltd

Date: 25 May 2022

## Appendix A Designer's Risk Assessment

**DESIGN RISK ASSESSMENT**

Project	Lime Academy – Brookfield House – Heating Distribution		
Document Reference	22411		
Date	25 May 2022		
Site Description	SEN School		
Project Description	Removal and replacement of boiler system	Client	Lime Academy Trust



Ref	Activity	Persons at risk	Potential Hazards	Design Measures taken to eliminate or reduce hazard	Information on residual risks
1	Persons being struck by contractor's vehicles	1, 2, 3	Conflict/collision with construction vehicles and members of the public		<p>Keep clean all site vehicles, service roads, car park areas, footpaths, etc.</p> <p>Access into the site is via the designated site entrance.</p> <p>Contractor's vehicles will only park in designated areas and the site speed limit will be adhered to at all times.</p> <p>Construction related deliveries will be pre-planned and time agreed so that they do not coincide with other activities on-site.</p>
2	Protection of work spaces	1, 2, 3	Persons and/ or materials/ equipment falling from height	Drawing	Exclusion areas will be created by sheeted screens to prevent people from walking into the area of works and being struck by any falling materials.
3	Construction and decoration of new internal surfaces	1, 2	Exposure to materials hazardous to health.	COSHH Material Data Sheets	<p>Awareness of COSHH risk assessments and use of PPE when handling materials.</p> <p>Pay particular attention to the precautions and handling procedures etc. detailed in the COSHH Material Data Sheets relating to products that may be encountered during the works.</p>

(1) Maintenance workers (2) Construction Workers (3) Members of the public

Ref	Activity	Persons at risk	Potential Hazards	Design Measures taken to eliminate or reduce hazard	Information on residual risks
4	Demolition and preparation of internal surfaces	1, 2, 3	Asbestos	Refurbishment and Demolition survey  HSG210 EM1	<p>All contractor's operatives have undertaken Asbestos Awareness Training and will work in accordance with HSG210 EM1</p> <p>Copy of Refurbishment and Demolition survey, permit to work (PTW) and all related documentation to be retained on the site premises.</p> <p>Hospital management and asbestos authorising officers to be made aware of its location and content and of all areas which were beyond the scope of the survey e.g. ceiling voids.</p> <p>No invasive work to be conducted without reference to the survey.</p> <p>Where there is any doubt about whether a substance or structure may contain asbestos, then no work can be undertaken and the Contract Administrator notified immediately.</p>
5	Demolition, preparation of internal surfaces, cutting material etc.	1, 2, 3	Dust	N/A	<p>PPE3 masks should be worn when required. Other person's on-site requiring access to the work area during these works should also wear appropriate PPE.</p> <p>Dampen surfaces where possible.</p>

(1) Maintenance workers (2) Construction Workers (3) Members of the public

Form 142 | Date: March 19

Ref	Activity	Persons at risk	Potential Hazards	Design Measures taken to eliminate or reduce hazard	Information on residual risks
6	Demolition, preparation of internal surfaces, cutting material etc.	1, 2, 3	Noise	N/A	Ambient noise levels from these works will not generally exceed the HSE permitted levels as detailed in HSE Noise in Construction INDG127 (rev)
7	Works to internal surfaces	1, 2, 3	Trip hazard	Corridor works are to done one side at a time to retain access at all times.	All designated walkways will be kept clear of materials/ rubbish and electrical leads so to eliminate any trip hazards to other persons on-site.
8	Working on full height walls and ceilings	1, 2	Falling from height	Where possible works to reduced heights specified.	<p>Contractor shall use safe working methods, providing method statements.</p> <p>No adaptations or improvisations to be made to any access provisions unless approved.</p> <p>Use of powered access platforms, man safe system, safety barriers on scaffold and platforms should be employed where possible.</p> <p>Appropriate PPE to be worn at all times.</p>

(1) Maintenance workers (2) Construction Workers (3) Members of the public

Form 142 | Date: March 19

Ref	Activity	Persons at risk	Potential Hazards	Design Measures taken to eliminate or reduce hazard	Information on residual risks
9	Manual handling	1	Personnel injury from working practices, for example, Manual handling.		<p>All contractors and their employees should be made aware of the HSE's manual handling guidelines and should not be carrying materials individually that could cause serious injury if dropped.</p> <p>The working area should be cleared of potential trip hazards so as to limit the amount of obstacles to traverse whilst moving large objects.</p> <p>Good fitting gloves are to be worn when carrying materials that could cause cuts or abrasions.</p>
10	Using hand tools	1	Injury / electrocution and Hand Arm Vibration Syndrome		<p>All electric tools required for the proper execution of the works will meet with the requirements of the Electricity at Work regulations 1989.</p> <p>They will operate either from rechargeable batteries or 110V supply and where applicable are PAT Tested.</p> <p>All power tools are of a modern balanced design and are regularly maintained.</p> <p>Any drilling operations are restricted to 15 minutes of operation with a minimum 5 minute break.</p>

(1) Maintenance workers (2) Construction Workers (3) Members of the public

Form 142 | Date: March 19

Ref	Activity	Persons at risk	Potential Hazards	Design Measures taken to eliminate or reduce hazard	Information on residual risks
11	All works	1, 2, 3	Fire		<p>Contractors to advise of procedures and any alternative routes during contract work.</p> <p>Smoking not permitted on site.</p> <p>Hot works permits used where applicable.</p> <p>Combustible materials to be stored in agreed areas unless required for immediate use.</p> <p>Appropriate fire extinguishers to be provided.</p> <p>Flammable liquids / compressed gases appropriately stored.</p> <p>In the unlikely event of a fire the contractors will raise the alarm, and if safe to do so turn off the gas supply and attempt to extinguish the fire with the equipment provided. If these attempts fail, the site will be evacuated and the</p> <p>Fire and Rescue Service will be called by phoning 999 to extinguish the fire. All operatives will be informed of the Fire Exit positions and muster points. All fire exits will be kept clear of any obstructions, e.g. materials and rubbish.</p>

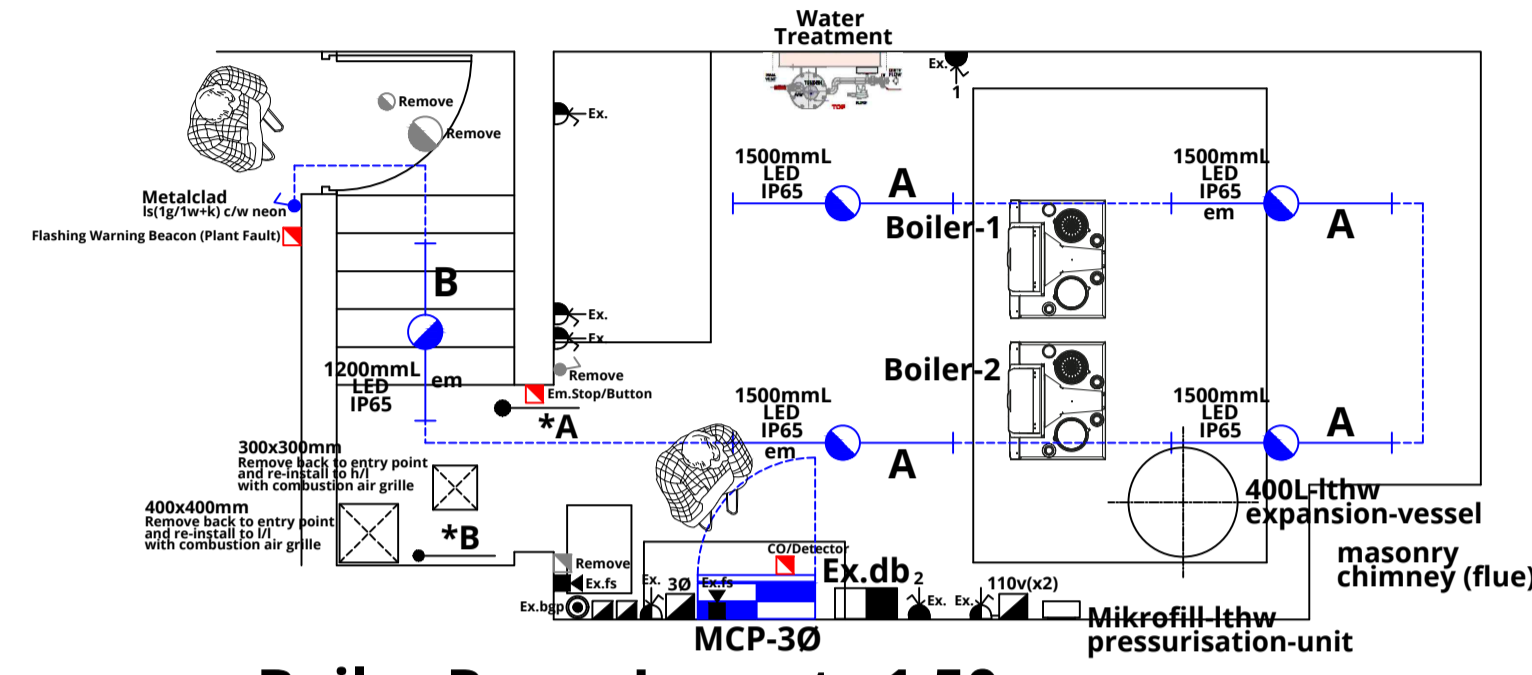
(1) Maintenance workers (2) Construction Workers (3) Members of the public

Form 142 | Date: March 19

Ref	Activity	Persons at risk	Potential Hazards	Design Measures taken to eliminate or reduce hazard	Information on residual risks
12	Cleaning after demolition	1	Infected items		In the event that our operatives find any needles or similar sharp or possibly infected implements when clearing rubbish, the client will be immediately informed & requested to arrange for appropriate disposal.

(1) Maintenance workers (2) Construction Workers (3) Members of the public

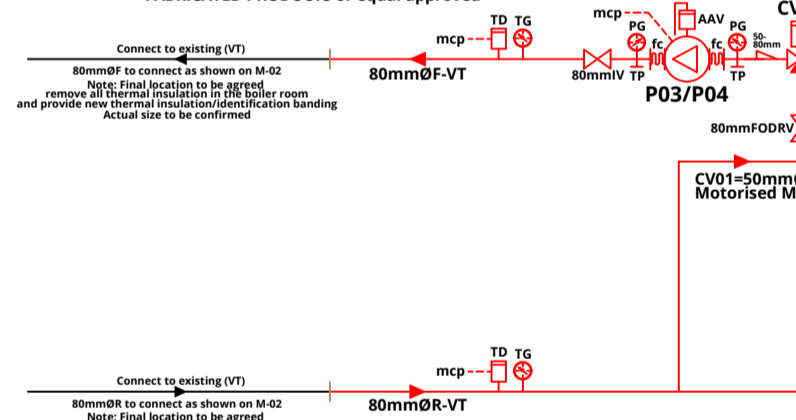
Form 142 | Date: March 19



**Boiler Room Layout 1:50  
-Proposed Installation Works**

**NEW CIRCULATING PUMPS:**

P03/P04: GRUNDOS PUMPS LIMITED - Provide new LTHW Boiler Circulating Pumps (Twin Head) Type Magna-1D-80-60F  
Electrical Supply: 230V/1PH/50Hz/70-0.24-2.37A  
P01/P02: GRUNDOS PUMPS LIMITED - Provide new LTHW VT Heating Pumps (Twin Head) Type Magna-1D-80-120F  
Electrical Supply: 230V/1PH/50Hz/70-0.31-5.06A  
All pumps are to be installed fully in accordance with manufacturer's instructions  
All pumps are to be provided with flexible connection as manufactured by FABRICATED PRODUCTS or equal approved

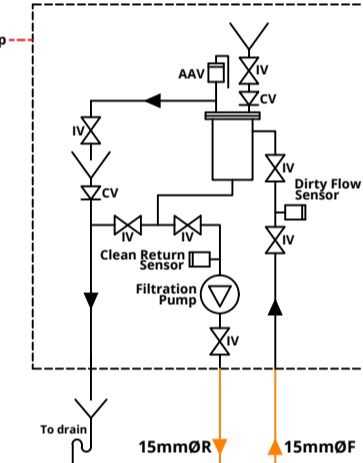


All new/existing pipework in the boiler room shall be thermally insulated  
Thicknesses and finishes shall be as set out in PSA/DOE extant standard specification M&E3  
All pipework shall be finished with SOGONOPAK  
Identification of services shall be in accordance with BS1710  
All new LTHW heating system pipework shall be mild steel tube to BS1387 with screened and socketed fittings  
All new hot and cold water service pipework shall be run in copper tube to BSEN10957 with capillary or compression fittings  
Note: Other pipework methods can be suggested by the Mechanical Contractor for approval by Concept-MEP

The Mechanical Contractor shall allow to isolate the existing boiler room gas distribution and purge to allow reconfiguration as detailed  
All works to be strictly in accordance with the Gas Safety Regulations

**NEW WATER TREATMENT:**

Boss X-POT 6+  
Combined Dosing Pot  
Magnet Filter  
Cartridge Filter  
Dir/air Separator  
BSS Code 16920067  
940mmWx415mmDx290mmH  
Weight=73.0kg(empty)  
Electrical Supply: 230v-1ph-50Hz-75W  
Provide spare cartridge filter

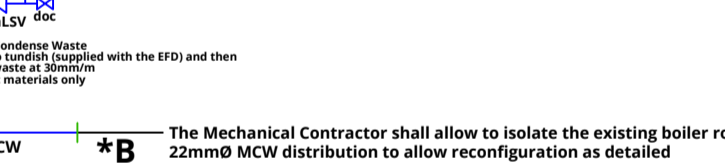


**POWERFLUSH:**

The Mechanical Contractor shall allow to carry out a system pressure test and then a full powerflush of the existing heating system to ensure it is fully cleaned prior to the connection of new equipment  
Allow to remove all thermal insulation from all existing/retained pipework in the boiler room area and replace to match new pipework  
Thermal insulation complete with identification banding in accordance with BS1710 (SOGONOPAK finish)

**NEW PRESSURISATION SYSTEM:**

LTHW Pressurisation Unit - 250mmWx112mmDx270mmH / Weight=5.0kg  
MicroFill 3 Electronic Filling Device (supplied with IP's and flexible connector) complete with 400L expansion vessel - MicroPro-8-400 (Part Code EVZ290400) 740mmØx1066mmH / Weight=65.0kg  
Note-1: System pressure to be kept as low as possible  
Note-2: The Mechanical Contractor shall allow to isolate, drain down, disconnect and remove existing F&R tank in rooftop tank room including removal of all CF & OV pipework (as far as practically possible) and cut back of MCW to nearest system 'live' point to ensure no dead leg is left in-situ



**NEW BOILERS 1&2:**

Provide and install two (2) REMHA COMMERCIAL Gas-220-Ace-160 High Efficiency Floor Standing Fully Condensing Boilers with Ultra Low NOx Emissions (Product Code 7663312)  
Electrical Supply=240v/1PH/50Hz/47-275W  
800mmWx577mmDx1652mmH / Weight=205kg(dry) / Output=31.5-152.1kW (3.4-16.5m.cu/hr)  
Boilers to be complete with 25mmØ(bspM) gas connection, 40mmØ(bspM) LTHW Heating F&R connections, 40mmØ(o/d) plastic condensate connection, 150mmØ(i/d) flue outlet, 200mmØ(i/d) combustion air inlet (provided with 500mmL REMHA air inlet filter kit), and boiler commissioning (Product Code L002B-2)  
All as per their quotation reference BHQ-1139707 (27.01.2022)  
Contact: John Cartledge / Phone: 0118 978 3434 / Mobile: 07850 618657  
e-Mail: john.cartledge@broadheating.co.uk  
Ensure commissioning is carried out by BROAG Technical Service Engineer

**NEW BOILERS FLUES:**

Flue arrangement to be supplied and installed by CHIMNEY & CANOPY SYSTEMS LIMITED  
- 1 Jeddo Street, Wolverhampton, West Midlands WV2 4EN  
Phone: 01902 393900 / e-Mail: sales@chimneycanopy.co.uk  
All as per their quotation reference SE-10468  
Each Boiler Flue shall have a vertical riser into a common stainless steel flue header and into existing masonry chimney with suitable liner and high level external termination point (suitably weathered on exit) with terminal on top at required height  
All installed in accordance with boiler manufacturer's recommendations  
The flue specialists shall allow for the existing complete flue system removal  
Allow for all access equipment required for works  
Note-1: The Mechanical Contractor shall allow a builders-work provisional sum and contingency allowance  
Note-2: Flue specialists to allow for works to combustion air ventilation

**NEW MOTOR CONTROL PANEL:**

The Mechanical Contractor shall allow to employ control specialists CONTROL PANEL SERVICES LIMITED  
- Blaby Business Park, Rose Way, Blaby, Leicester LE5 4BY  
Contact: Dave Holland / Phone: 0116 261 2740 / Mobile: 07782 297923 / e-Mail: dave.holland@cpscontrols.com  
to provide and install a new mechanical services control panel/system as per their quotation reference CPS-22022 including controls for 100mmØ gas solenoid valve, emergency stop button, boiler sequence controller with flow sensor and transformer, external common alarm enclosure with flashing xenon lamp (final position to be agreed), frost protection control, three port mixing control valves for variable temperature circuit with optimiser/compensator with outside sensor, room sensor, immersion sensors, twin head circulating pumps with auto-changeover (shunt & VT circuits), existing booster set, existing HWS arrangement, system extension timer, internal alarm sounder, and 3Ø kWh sub-meter.  
Allow for the control panel to be commissioned by the supplier along with demonstrations to the client  
Allow for the provision of the new electrical installation for the system detailed with isolators  
Allow to disconnect/re-connect existing 3Ø electrical supply to new control panel  
Note-1: Ensure the new control panel supplies all existing items of school mechanical services installation  
Note-2: The Extension timer is to individually cover the following existing zones:  
LTHW Heating Zone 1 / HWS  
The control specialists have allowed to carry out new electrical installation works to the boiler room area to comprise new lighting and mechanical services power (electrical accessories to be MK 'Metalclad Plus' or MK 'Commando' ranges)  
Provide and install type 4no. 'A' 1500mmL & 1no. 'B' 1200mmL LED vapour-proof fluorescent light fittings, 3no. three hour maintained emergency types as above.  
Remove existing boiler room lights & switches and reconfigure existing lighting circuit

**STRIP-OUT WORKS:**

The Mechanical Contractor shall allow to isolate, drain down, disconnect, dismantle, remove from site, and safely dispose of the following:  
i) Two (2) floor standing gas fired atmospheric boilers and associated piped services connections STREBEL Type RUIS-4  
ii) Flue arrangement from existing boilers and external flue terminals (to be removed by flue specialists)  
iii) All LTHW cold feed and open vent pipework from F&E tank as far as practically possible  
iv) All LTHW heating F&R pipework from boiler room  
v) Sections of gas supply pipework from boiler room as required for new installation  
vi) All thermal insulation on LTHW heating pipework in the boiler room  
Note: Allow to thermally insulate all new/existing retained LTHW/MCW system pipework on completion of the works with identification in accordance with BS1710 (SOGONOPAK finish)  
vii) Control panel, controls, and electrical services as detailed (to be removed by controls specialists)

**Gas Supply and LTHW Heating Services Schematic Details  
-Proposed installation works**

REV	DATE	DRAWN BY	REVISION DESCRIPTION
T1	24.05.22	AJK	Tender Issue 1

CLIENT	PROJECT
RAM	Blockfield House Campus 1 Alders Avenue - Woodford Green Essex IG89 9PY Heating Replacement Project

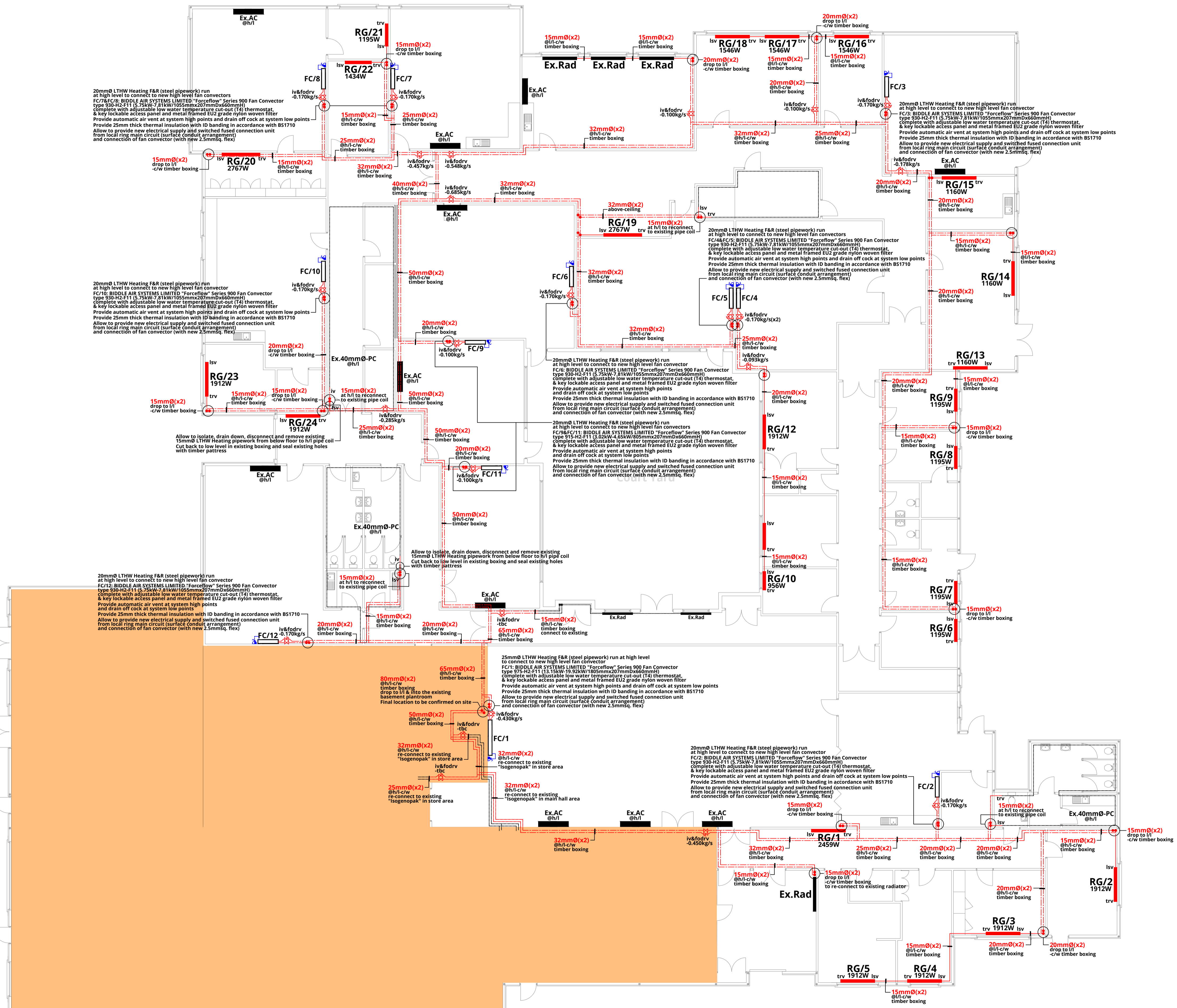
**CONCEPT MEP**  
Engineering Consultants

CONCEPT MEP LIMITED, PINNACLE HOUSE, NEWBARD RD, PETERSBOROUGH, PE1 5YD  
www.concept-mep.co.uk | info@concept-mep.co.uk | 07333 857 565

DRAWN BY	DATE	SCALE	SHEET SIZE
AJK	19.05.2022	1:50	A1
CHECKED BY	DATE	DRAWING STATUS	
LMG	24.05.2022	TENDER	

PROJECT / DRAWING NUMBER: 013-45-M-01  
REVISION: T1

COLLABORATE - INNOVATE - MODERATE



**NOTES**

**RADIATOR SCHEDULE:**

- RG/1: Stelrad LST "Standard" 800mmHx1760mmL Type-K2 / Heat Output-2459W / UIN-145070
- RG/2-RG/5: Stelrad LST "Standard" 650mmHx1760mmL Type-K2 / Heat Output-1912W / UIN-145046
- RG/6-RG/9: Stelrad LST "Standard" 650mmHx1160mmL Type-K2 / Heat Output-1195W / UIN-145043
- RG/10: Stelrad LST "Standard" 650mmHx960mmL Type-K2 / Heat Output-956W / UIN-145042
- RG/11: Stelrad LST "Standard" 650mmHx1360mmL Type-K2 / Heat Output-1434W / UIN-145044
- RG/12: Stelrad LST "Standard" 650mmHx1760mmL Type-K2 / Heat Output-1912W / UIN-145046
- RG/13-RG/15: Stelrad LST "Standard" 650mmHx1760mmL Type-K1 / Heat Output-1160W / UIN-145030
- RG/16-RG/18: Stelrad LST "Standard" 650mmHx1760mmL Type-P+ / Heat Output-1546W / UIN-145038
- RG/19-RG/20: Stelrad LST "Standard" 800mmHx1960mmL Type-K2 / Heat Output-2767W / UIN-145071
- RG/21: Stelrad LST "Standard" 650mmHx1160mmL Type-K2 / Heat Output-1195W / UIN-145043
- RG/22: Stelrad LST "Standard" 650mmHx1360mmL Type-K2 / Heat Output-1434W / UIN-145044

All radiators to be 15mmØ TBOE connections complete with a tamperproof thermostatic radiator valve on the flow and a lockshield valve on the return. Provide drain off cock on all system low points. All distribution pipework to be thermally insulated with 25mm thick foil faced thermal insulation and provided with identification banding in accordance with BS1710. All existing LTHW Heating pipework is to be drained down, disconnected and removed from site. Pipework in the service trench to be cut back to just inside the entry point and then left drained down in-situ. Pipework rising to low level on the ground floor will be cut as low as possible and then left in-situ. Heating in area shaded orange is to be left as existing but re-connected onto the new LTHW pipework as detailed on the drawings. Allow to box in (in timber) all exposed pipework except where above ceiling or in store areas. Allow to provide access panels at all valve locations. Allow to paint primer and then white (matt finish). All to be confirmed prior to works commencing. Access was limited during Concept-MEP surveying. Pipework routes shown to be used for tendering purpose. Prior to works commencing the final pipework routes shall be agreed prior to works commencing. Allow for an adjustable room thermostat in each area with a fan convector.

REVISIONS

REV	DATE	DRAWN BY	REVISION DESCRIPTION
T1	24.05.22	AJK	Tender Issue 1

CLIENT

PROJECT

Brookfield House Campus  
1 Alders Avenue - Woodford Green  
Essex IG89 9PY  
Heating Replacement Project

TITLE

Ground Floor Plan  
LTHW Pipework Replacement  
Mechanical Services Installation  
Proposed Works

CONCEPT MEP  
Engineering Consultants

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DRAWN BY	DATE	SCALE	SHEET SIZE
AJK	19.05.2022	1:100	A1

CHECKED BY	DATE	DRAWING STATUS
LMG	24.05.2022	TENDER

PROJECT / DRAWING NUMBER

013-45-M-02

REVISION

T1

COLLABORATE - INNOVATE - MODERATE



