conisbee | Consulting Structural Engineers
Consulting Civil Engineers

The Horniman Museum

South Hall Offices - Filler Joist Repairs

Tender Document

London
1 – 5 Offord St London N1 1DH
Telephone 020 7700 6666

Norwich
2 Woolgate Court
St Benedicts Street
Norwich NR2 4AP
Telephone 01603 628 074

Cambridge
47 – 51 Norfolk Street
Cambridge CB1 2LD
Telephone 01223 656 058

design@conisbee.co.uk
www.conisbee.co.uk

Ref: 100165-TD/S Prior
Date: 23 August 2016
Rev No: B

CCAS REGISTERED ISO 9001 • 14001 UKAS MANAGEMENT SYSTEMS 055
2010/586

INVESTORS IN PEOPLE

TABLE OF CONTENTS

1.0 INSTRUCTIONS TO TENDERERS

1.1 General

Tenderers should read this tender and all other documents supplied carefully before submitting their response.

Failure to comply with the requirements detailed within the Tender Documents may result in rejection of the tender submission. Tenderers must fully understand and accept the extent and nature of the works and the contractual obligations identified within the Tender Documents and will be deemed to have done so before submitting a tender.

1.2 Tender Documentation

The Tender Documentation contains the following:

- Instructions to Tenderers
- Project Details
- Terms and Conditions
- Schedule of Works for Pricing
- Previous Reports
- Specification Sheets and Drawings
- Contractor Competence / Resources Questionnaire
- Form of Contract Forms
- Security of Due Performance Forms

The client reserves the right to modify or amend the Tender Document at any point prior to the deadline for submission of the tenders. Any such changes will be notified in writing. Should the modifications be significant the deadline for submission of the tenders may be extended at the client's discretion.

1.3 Enquiries

Any technical or contract queries in relation to this tender should be directed to

Simon Prior

Conisbee Consulting Structural Engineers

1-5 Offord Street

London

N1 1DH

E-mail: simon.prior@conisbee.co.uk

All correspondence during the tender period to be solely by e-mail.

Should the Tenderers wish to visit the museum during the tender period this should be arranged through the museums Estates Manager. Visits are to be on the following dates 1st,2nd and 5th September between 10am and 4.30pm.

Tim Hopkins

Horniman Museum and Gardens

T +44 (0)20 8699 1872 (ext 116)

T +44 (0)20 8291 8680 (Direct)

E thopkins@horniman.ac.uk

1.4 Tender Return

The tender return must be submitted to Simon Prior of Conisbee at the address provided in 1.3 above no later than noon on Friday 16th September 2016.

Any tenders received after this date and time will not be considered. No allowances will be made for disruptions to or failure of postal services resulting in the non delivery if the documents.

The client reserves the right to amend or modify the Tender Documents prior to awarding the contract. All Tenderers will be notified of any such amendments.

1.5 Conditions of Contract

The contract will be in accordance with the JCT Intermediate Building Works Contract 2011.

1.6 Tender Validity

Tenders shall remain valid for a period of 90 Days from the tender submission date stated in 1.4.

On award of the contract the selected Tenderer shall comply with all of the provisions contained within the Tender Documentation, subject only to any agreed exceptions and amendments.

The Tenderer warrants that the performance of the contract shall be in accordance with the requirement of the contract and any codes of practice for the industry or such works.

1.7 Tender Costs

No costs will be paid in relation to the time expended or expenses incurred in the preparation and submission of the tenders, irrelevant of whether the tenderer is successful or not or should any amendments or modifications be made to the Tender Documents.

1.8 Accuracy of Price / Information

Tenderers must ensure that before submitting a response all arithmetical calculations are checked for accuracy and all necessary information has been supplied.

1.9 Guarantee

An insurance backed guarantee shall be provided for the works undertaken. The provision and period (yrs) of such guarantees is to be confirmed within the tender submission along with any exclusions to the guarantee.

1.10 Evaluation of Tenders

Conisbee will examine all tenders for completeness and accuracy and may seek clarification or additional information where necessary.

Following evaluation of the tenders all or a selection of the Tenderers may be invited to attend a tender interview at the Horniman Museum or the Conisbee offices (TBA), during the week commencing 19th September 2016.

1.11 Award Criteria

The contract will not be awarded solely on price and the tenderer will be required, through the tender submission and tender interviews, to demonstrate experience, understanding, and competency in undertaking such works and the ability to effectively resource such projects.

The award criteria will be:

45% Price

55% Quality – Structured as follows :

- Health and Safety 15%
- Relevant Experience 15%
- Competency 20%
- Technical 50%

1.12 Contract Management and Monitoring

Conisbee will be procuring the contract on behalf of the client, however the contractor will be appointed directly by the client.

Conisbee will undertake technical monitoring of the project in conjunction with a QS to be appointed by Conisbee.

Conisbee will act as structural engineers for the duration of the project and will provide all direction, monitoring and advice in relation to structural works.

The role of Principal Designer is to be undertaken by Pellings.

Details of all key members of the project team are contained within the attached documents.

1.13 Tender Timetable

Tender Submission **16th September 2016**
Tender Reviews **Week Commencing 19th September 2016**
Tender Interviews **Week Commencing 19th September 2016**

1.14 Extension of the tender period

Any request for an extension of the tender period must be received at least seven working days before the due date for return, however no guarantee can be given that an extension will be granted.

1.15 Tender Returns

You must include the following with your submission:

- A response to the Contractor Competence / Resources Questionnaire
- Tender Quote / Pricing Schedule – clearly outlining the costs associated with each of the items specified in the scope of works, all prelims and running costs for the duration of the project.
- Form of tender form
- Security of due performance form

2.0 PROJECT DETAILS

2.1 The Horniman Museum - South Hall Offices

The Horniman Museum was opened in 1901 and has undergone various changes since, most notably in 1911 with the addition of a new building and 1999 with the demolition and redevelopment of parts of the structure as part of a heritage lottery funded scheme.

The Museum comprises the North and South exhibition halls, laboratories and offices to the East of the Halls, the modern addition opened in 2002 (exhibition areas and visitor facilities), the stone clock tower and stairs to the South of the museum which houses the main entrance lobby and various other buildings including the iron and glass conservatory to the North of the main museum buildings.

The areas of structure included within these works are within the original structure which generally comprises solid brickwork walls, filler joist floor and balcony slabs with barrel roofs to the exhibition halls and a combination of flat and pitched roofs throughout the rest of the structure.

Following spalling of render and plaster to the North Hall and North and South hall offices Conisbee were appointed to inspect the balcony and assess its condition. The findings and recommendations resulting from this inspection are contained in the Conisbee report reference 070283/D Crous dated 17 July 2008. This report forms part of the Conisbee Technical Report, an extract of which is contained within Appendix B of this report Ref 070283/GJ/SP – 1.1 Final. As a consequence of this initial report representatives from Conisbee and the Horniman Museum and Gardens (HM&G) met to discuss the issues raised and the implications for the maintenance of the structure. This resulted in Conisbee submitting detailed recommendations and a way forward for dealing with the potential structural and durability issues identified.

As a result of the proposed strategy submitted to HM&G by Conisbee and a subsequent meeting with representatives from the HM&G Senior Management Team and Maintenance staff HM&G appointed Martech Technical Services Ltd (Martech) to undertake the first stage of the phased strategy which included safety survey, testing and investigation of the building fabric undertaken under the direction of Conisbee.

These works were undertaken between 01 December 2008 and 09 January 2009 and the factual results available to date are contained in the Martech report reference 08103, which can be made available upon request. Following our inspections and observations during the safety and investigation works and appraisal of Martech's report Conisbee were able to report on the condition of the building fabric inspected and recommendations for the repair of defective areas and these findings are provided within the report Ref 070283/GJ/SP – 1.1 Final of which an extract is contained in Appendix B.

In 2010 the first phase of repair works were undertaken to the filler joist floors to the North Hall Gallery. These works were prioritised from a health and safety point of view and protection measures were put in place in the North and South Hall offices to mitigate against the risk of falling material should it become loose. This took the form of a hammer tap survey to removal all immediately loose and dangerous material and encapsulation of the soffits using debris netting and batons. This minimised the risk of falling material on users of the offices and allowed ongoing inspection and monitoring of the condition of the soffits.

It should be noted that the remainder of the museum will remain open and access will need to be maintained to all existing fire escape routes. The contractor should propose to the satisfaction of the museum how they intend to manage this element of the works within the Tender Return along with the proposed movement of plant and materials within the site, which where possible should be kept to a minimum (i.e. materials and plant required for each day brought into the work area in the morning prior to opening of the museum / arrival of museum staff). In addition noise and vibration should be minimised wherever possible and dust suppression measures should be implemented.

2.2 The Project

The repair works to be included within this phase of the project include the South hall offices soffit and the soffit in the first floor office within the clock tower. These areas are marked on the plans included in the appendices.

2.3 Scope of Works

The schedule of works are detailed for pricing in the preliminaries and works schedules in Appendix A both of which should be read in conjunction with the specification sheets provided in Appendix C and considering all other information provided within this Tender Document.

2.4 Contract Period

The contract period is envisaged to be in the order of 13 weeks. Although, this may be revised upon assessment of the tender returns. **Please provide an outline programme for the works including all additional items outlined in the preliminaries with your tender submission.**

2.5 Start Date

The site works are intended to commence on **17th October 2016** . This start date is however subject to change at the client's discretion. The tenderer will be advised in good time of any changes in the anticipated start date.

2.6 Project Management

It is envisaged that prior to the commencement of the works on site the project team (Conisbee, client, QS, Principal Designer, the selected contractor and any other client representatives as requested by the client) will attend a pre-commencement meeting.

Conisbee will undertake regular site visits to review the project as a whole and to direct and monitor the structural aspects of the project. It is envisaged this will involve visits at least once a week.

2.7 Accurate Records

Accurate records of the project must be kept at all times and information provided to all relevant parties promptly upon request.

2.8 Pre-contract Surveys

The contractor **will be required** to undertake pre-commencement and post contract condition surveys of any areas of the structure which may be affected by the works in order to satisfy themselves, the client and the CA that no damage has occurred as a result of the site operations. This should include rooms adjacent to the works area and include the condition of any exhibition cases or other such items fixed to the walls in these areas.

3.0 TERMS AND CONDITIONS

3.1 Contract

The contract will be in accordance with the JCT Intermediate Building Works Contract 2011.

3.2 Valuations and Payment

Valuations will be agreed between the project QS and the contractors QS at monthly intervals. 5% of the contract sum will be held in retention until final completion. 2.5% of the retention will be released upon practical completion.

3.3 Defects Liability Period and Retentions

There will be a defects liability period of 12 months from the date of final completion and 2.5% of the contract sum will be retained until completion of the defects liability period.

APPENDIX A – PRELIMINARIES AND WORKS SCHEDULES

PRELIMINARIES AND WORKS SCHEDULES

for

FILLER JOIST SOFFIT REPAIRS

at

THE HORNIMAN MUSEUM, LONDON SE23 3PQ

August 2016

CONTENTS

PART A

PRELIMINARIES AND GENERAL CONDITIONS

A10 PROJECT PARTICULARS

110 THE PROJECT

- Name: The Horniman Museum and Gardens
- Nature: Filler joist soffit repairs to the South Hall offices and associated electrical enabling works.
- Location: The Horniman Museum and Gardens,
  100 London Road
  Forest Hill
  London SE23 3PQ
- Length of contract: 13 weeks although this may be revised upon assessment of the tender returns.

120 EMPLOYER (CLIENT)

- Name: The Horniman Museum and Public Park Trust
  100 London Road
  Forest Hill
  London SE23 3PQ

Contact:

- Title: Horniman Museum and Gardens - Estate Manager
- Name: Tim Hopkins
- Address: The Horniman Museum and Gardens
  100 London Road
  Forest Hill
  London SE23 3PQ
- Telephone: 020 8291 8680
- e-mail: thopkins@horniman.ac.uk

130 PRINCIPAL CONTRACTOR

- To be appointed

140 PERSON EMPOWERED BY THE CONTRACT TO ACT ON BEHALF OF THE EMPLOYER

- Title: Contract Administrator
- Name: Conisbee Consulting Structural Engineers
- Address: 1-5 Offord Street
  London N1 1DH
- Telephone: 020 7700 6666
- Fax: 020 7700 6686
- e-mail: simon.prior@conisbee.co.uk

150 QUANTITY SURVEYOR

- Name: Conisbee Consulting Structural Engineers
- Address: 1-5 Offord Street
  London N1 1DH
- Telephone: 020 7700 6666
- Fax: 020 7700 6686
- e-mail: simon.prior@conisbee.co.uk

A10 PROJECT PARTICULARS

160 PRINCIPAL DESIGNER

- Name: Pellings
- Address: 2 Waterloo Court
  10 Thread Street
  London
  SE1 8ST
- Telephone: 020 7202 8415
- e-mail: KBushell@pellings.co.uk

A11 TENDER AND CONTRACT DOCUMENTS

110 TENDER DRAWINGS

- The tender drawings are:

  SSK001 – Filler Joist Repair Detail
  S100 – Plan Showing Extent of Works Area

120 CONTRACT DRAWINGS

- The contract drawings: Same as the tender drawings.
- Exceptions: None.

160 PRECONSTRUCTION INFORMATION

- Format: Preconstruction information is included in separate documentation

A12 THE SITE/ EXISTING BUILDINGS

110 THE SITE
- Description: The works are located within the South Hall offices located within the Horniman Museum, 100 London Road, Forest Hill, London SE23 3PQ.

120 EXISTING BUILDINGS ON/ ADJACENT TO THE SITE
- Description: The Horniman Museum and Gardens.

140 EXISTING MAINS AND SERVICES
- Drawings: None.
- Other information: Existing cables and other services will be removed from soffits prior to the commencement of the filler joist concrete repair works and reinstated following completion of the filler joist concrete repair works by the appointed contractor. All reinstated electrical works to be in accordance with current regulations and to be undertaken and certified by an appropriately qualified professional.

160 SOILS AND GROUND WATER
- Information: Not applicable.

200 ACCESS TO THE SITE
- Description: Vehicular access to the site is by means of Horniman Drive gate only.
- Limitations: Comply with the guidelines for vehicles using Horniman Gardens which is included as an appendix to these preliminaries.
- All workforce must wear the prescribed Horniman Museum identification badge / work permit in a prominent position at all times when in the Horniman Museum. The badge / permits / key will be issued at the security desk on arrival and must be returned on departure. The badges / permits / keys must not be taken off site and must be handed in whenever leaving the Horniman Museum.
  Note: Refer also to *'Museum Rules for Visiting Contractors'* which is included as an appendix to these preliminaries. Fire exits must be kept clear at all times.
- The fire escape door and external steps and ramp to the conservatory at the rear of the North Hall are an escape route and are to be kept clear at all times.

210 PARKING
- Restrictions on parking of the Contractor's and employees' vehicles: Currently NO parking spaces will available on site for use by the contractor. The client is investigating the possibility of locating welfare facilities within the contractors parking bays – TBC – Contact Tim Hopkins, Horniman Museum and Gardens Estates Manager, for further information (See section A10 for contact details).

220 USE OF THE SITE
- General: Do not use the site for any purpose other than carrying out the Works.
- Limitations: Refer to the *'Museum Rules for Visiting Contractors'* which is included as an appendix to these preliminaries.

230 SURROUNDING LAND/ BUILDING USES

- General: Adjacent or nearby uses or activities are as follows:
  - The works are located within the Horniman Museum which will remain open to the public for the duration of the contract.

240 HEALTH AND SAFETY HAZARDS

- General: The nature and condition of the site/ building cannot be fully and certainly ascertained before it is opened up.

250 SITE VISIT

- Before tendering: Ascertain the nature of the site, access thereto and all local conditions and restrictions likely to affect the execution of the Works.
- Arrangements for visit: prior appointment with the Horniman Museum and Gardens Estate Manager – See section A10 for contact details.

110 PREPARATORY WORK BY OTHERS
- Works: Carried out in house by the client or under a separate contract prior to commencement of main repair works.
- Description:
  Removal and reinstatement of fire alarms within works area.
  Office furniture and files and belongings removals

120 THE WORKS
- Description: Filler joist soffit repairs to North and South Hall offices

140 COMPLETION WORK BY OTHERS
- Description:
  TBA

360 JCT INTERMEDIATE BUILDING CONTRACT (IC)
- The Contract: JCT Intermediate Building Contract 2011 Edition incorporating New Rules of Measurement Update August 2012 and Amendment 1 dated March 2015.
- Requirement: Allow for the obligations, liabilities and services described

THE RECITALS

First
THE WORKS AND THE CONTRACT ADMINISTRATOR
- The work comprises: filler joist soffit repairs in the South Hall offices of the Horniman Museum and electrical enabling works.
- Architect/ Contract Administrator: See clause A10/140.

Second
CONTRACT DOCUMENTS
- Contract drawings: As listed in clause A11/120.
- Contract documents: Shall be provided as listed

Third
OTHER DOCUMENTS SUPPLIED BY THE EMPLOYER
- Specification
- Work Schedules

Fourth
PRICING BY THE CONTRACTOR
- Option A will apply: Option B will be deleted.
- Priced document: Within Option A the following words will be deleted:
  - 'Bills of Quantities/Specification'
- Priced Activity Schedule: The words 'and has provided the Employer with the priced schedule of activities annexed to this contract (the Activity Schedule)' will be deleted.

Sixth
INFORMATION RELEASE SCHEDULE
- The Sixth Recital will be deleted.

Eighth Recital
DIVISION OF THE WORKS INTO SECTIONS
- The Eighth Recital will be deleted

THE ARTICLES

3 ARCHITECT/ CONTRACT ADMINISTRATOR
- Architect/ Contract Administrator: See clause A10/140.

4 QUANTITY SURVEYOR
- Architect/ Contract Administrator: See clause A10/140

5 AND 6 PRINCIPAL DESIGNER / PRINCIPAL CONTRACTOR
- Principal Designer: See clause A10/160.
- Principal Contractor: See clause A10/130.

CONTRACT PARTICULARS

PART 1: GENERAL

Fifth Recital and clause 4.5
CONSTRUCTION INDUSTRY SCHEME (CIS)
- Employer at the Base Date is not a 'contractor' for the purposes of the CIS.

Seventh Recital
CDM REGULATIONS
- The project may be notifiable

Eighth Recital
DESCRIPTION OF SECTIONS
- Description of Sections
  - Not applicable

Ninth Recital
FRAMEWORK AGREEMENT
- Does not apply

Tenth Recital and Schedule 5 – 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: Paragraph 4 applies
- Performance indicators and monitoring: Paragraph 5 applies
- Notification and negotiation of disputes: Paragraph 6 applies
  Where paragraph 6 applies, the respective nominees of the parties are:
  Employer's nominee: to be confirmed
  Contractor's nominee; to be confirmed
  Or such replacement as each party may notify to the other from time to time.

Article 8
ARBITRATION
- Article 8 and clause 9.3 to 9.8 (arbitration) apply.

Clause 1.1
BASE DATE
- Base date: 10 days before return of tender

Clause 1.1
DATE FOR COMPLETION OF THE WORKS
- Date for Completion: 13 weeks from Commencement of the Works or earlierdepending upon the contractors proposed programme.

Clause 1.7
ADDRESSES FOR SERVICE OF NOTICES
-Employer
  - The Horniman Museum, 100 London Road, Forest Hill London SE23 3PQ
-Contractor
  - To be completed by the Contractor

Clause 2.4
DATE FOR POSSESSION OF THE SITE
- Date for Possession of the site: anticipated 17th October 2016 although this is subject to confirmation.

Clause 2.5
DEFERMENT OF POSSESSION OF THE SITE
- Clause 2.5 applies
- Maximum period of deferment is 6 weeks

Clause 2.23.2
LIQUIDATED DAMAGES
- At the rate of: £1,000 per week.

Clause 2.30
RECTIFICATION PERIOD
- Period: 12 months from the date of Practical Completion of the Works.

Clause 4.6
ADVANCE PAYMENT
- Does not apply

Clause 4.7.1
INTERIM PAYMENTS – DUE DATES
- The first date is to be agreed with the CA, and thereafter the same date in each month or the nearest Business Day in that month.

Clause 4.8.1
INTERIM PAYMENTS – PERCENTAGE OF VALUE
- Not achieved practical completion: Where the Works, or those works in a section, have not achieved practical completion, the percentage of total value in respect of the works that have not achieved practical completion is 95%
- Completed works: Where the Works, or those works in a section, have achieved practical completion, the percentage in respect of the completed works is 97½%.

Clause 4.9.4
LISTED ITEMS – UNIQUELY IDENTIFIED
- Listed items: Clause 4.9.4 will be deleted

Clause 4.9.5
LISTED ITEMS – NOT UNIQUELY IDENTIFIED
- Listed items: Clause 4.9.5 will be deleted

Clause 4.15 and Schedule 4
CONTRIBUTION, LEVY AND TAX FLUCTUATIONS
- Schedule 4 (Fluctuations Option) does not apply
- Percentage addition for Fluctuations Option: not applicable

Clause 6.4.1.2
CONTRACTOR'S INSURANCE - INJURY TO PERSONS OR PROPERTY
- Insurance cover (for any one occurrence or series of occurrences arising out of one event): £5,000,000.00 (£5 million pounds)

Clause 6.5.1
INSURANCE – LIABILITY OF EMPLOYER
- Insurance may be required

Clauses 6.7 and Schedule 1
INSURANCE OF THE WORKS – INSURANCE OPTIONS
- Schedule 1: Insurance option C applies
- Percentage to cover professional fees: 15 per cent

Clause 6.12
JOINT FIRE CODE
- The Joint Fire Code: applies
- The 'Works' are not specified as a 'Large Project'.

Clause 6.15
JOINT FIRE CODE – AMENDMENTS / REVISIONS
- The cost, if any' of compliance with amendments or revisions to the Joint Fire Code shall be borne by the Contractor

Clause 8.9.2
PERIOD OF SUSPENSION (TERMINATION BY CONTRACTOR)
- Period of suspension: 2 months

Clause 8.11.1.1 to 8.11.1.5
PERIOD OF SUSPENSION (TERMINATION BY EITHER PARTY)
- Period of suspension: 2 months

Clause 9.2.1
ADJUDICATION
- The Adjudicator is: to be confirmed
- Nominating body: The Royal Institution of Chartered Surveyors

Clause 9.4.1
ARBITRATION – APPOINTOR OF ARBITRATOR
- Appointer 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: VARIATIONS

SECTION 6: INJURY, DAMAGE AND INSURANCE

SECTION 7: ASSIGNMENT AND COLLATERAL WARRANTIES

SECTION 8: TERMINATION

SECTION 9: SETTLEMENT OF DISPUTES

EXECUTION
- The Contract: Will be executed under deed (signatures only)

A30 TENDERING/ SUBLETTING/ SUPPLY

MAIN CONTRACT TENDERING

110 SCOPE
- General: These conditions are supplementary to those stated in the Invitation to Tender and on the form of tender.

145 TENDERING PROCEDURE
- General: In accordance with JCT Tendering Practice Note 2012 'Main Contract Tendering'.
- Arithmetical errors: Alternative 2 is to apply.

160 EXCLUSIONS
- Inability to tender: Immediately inform if any parts of the work as defined in the tender documents cannot be tendered.
- Relevant parts of the work: Define those parts, stating reasons for the inability to tender.

170 ACCEPTANCE OF TENDER
- The Employer and Employer's representatives:
  - Offer no guarantee that any tender will be recommended for acceptance or be accepted.
  - Will not be responsible for any cost incurred in the preparation of any tender.

180 CDM PLANNING PERIOD
- Minimum: 3 weeks ending on the date for possession of the site.

190 PERIOD OF VALIDITY
- Period: After submission or lodgement, keep tender open for consideration (unless previously withdrawn) for not less than 90 days.
- Date for possession/ commencement: See section A20.

PRICING/ SUBMISSION OF DOCUMENTS

210 PRELIMINARIES IN THE SPECIFICATION
- The Preliminaries / General conditions sections (A10-A56 inclusive) must not be relied on as having been prepared in accordance with NRM2

220 PRICING OF PRELIMINARIES
- Charges: If the Contractor requires interim payments to include fixed and time related charges for specific items in the Preliminaries, those charges must be clearly shown against the items.

250 PRICED DOCUMENTS
- Alterations: Do not alter or qualify the priced documents without written consent. Tenders containing unauthorised alterations or qualifications may be rejected.
- Measurements: Where not stated, ascertain from the drawings.
- Deemed included: Costs relating to items, which are not priced, will be deemed to have been included elsewhere in the tender.
- Submit: within two working days of request.

A30 TENDERING/ SUBLETTING/ SUPPLY

310 TENDER
- General: Tenders must include for all work shown or described in the tender documents as a whole or clearly apparent as being necessary for the complete and proper execution of the Works.

480 PROGRAMME
- Programme of work: Prepare a summary showing the sequence and timing of the principal parts of the Works and periods for planning and design. Itemize any work which is excluded.
- Submit: within two working days of request.

515 ALTERNATIVE TIME TENDERS
- General: In addition to and at the same time as tendering based upon the date or period specified in section A20, an alternative tender based upon a different date for completion or period may be submitted.
- Date for completion: If any such tender is accepted the date for completion inserted in the Contract will be the date stated in the alternative tender or determined from the period stated in the alternative tender.

530 SUBSTITUTE PRODUCTS
- Details: If products of different manufacture to those specified are proposed, submit details with the tender giving reasons for each proposed substitution. Substitutions, which have not been notified at tender stage, may not be considered.
- Compliance: Substitutions accepted will be subject to the verification requirements of clause A31/200.

540 QUALITY CONTROL RESOURCES
- Statement: Describe the organisation and resources to control the quality of the Works, including the work of subcontractors.
- QA staff: Identify in the statement the number and type of staff responsible for quality control, with details of their qualifications and duties.
- Submit: within one week of request.

550 HEALTH AND SAFETY INFORMATION
- Content: Describe the organisation and resources to safeguard the health and safety of operatives, including those of subcontractors, and of any person whom the Works may affect.
- Include:
  - A copy of the contractor's health and safety policy document, including risk assessment procedures.
  - Accident and sickness records for the past five years.
  - Records of previous Health and Safety Executive enforcement action.
  - Records of training and training policy.
  - The number and type of staff responsible for health and safety on this project with details of their qualifications and duties.
  - Submit: within one week of request.

590 OUTLINE CONSTRUCTION PHASE HEALTH AND SAFETY PLAN

- Content: Submit the following information within one week of request:
  - Method statements on how risks from hazards identified in the pre-construction information and other hazards identified by the contractor will be addressed.
  - Details of the management structure and responsibilities.
  - Arrangements for issuing health and safety directions.
  - Procedures for informing other contractors and employees of health and safety hazards.
  - Selection procedures for ensuring competency of other contractors, the self-employed and designers.
  - Procedures for communications between the project team, other contractors and site operatives.
  - Arrangements for cooperation and coordination between contractors.
  - Procedures for carrying out risk assessment and for managing and controlling the risk.
  - Emergency procedures including those for fire prevention and escape.
  - Arrangements for ensuring that all accidents, illness and dangerous occurrences are recorded.
  - Arrangements for welfare facilities. NB The museum are currently investigating locating contractor welfare facilities within the contractors parking bays – Refer to Tim Hopkins, Horniman Museum and Gardens Estate Manager for further details (see Section A10 for contact details)
  - Procedures for ensuring that all persons on site have received relevant health and safety information and training.
  - Arrangements for consulting with and taking the views of people on site.
  - Arrangements for preparing site rules and drawing them to the attention of those affected and ensuring their compliance.
  - Monitoring procedures to ensure compliance with site rules, selection and management procedures, health and safety standards and statutory requirements.
  - Review procedures to obtain feedback.

SUBLETTING/ SUPPLY

630 DOMESTIC SUBCONTRACTS

- General: Comply with the Construction Industry Board 'Code of Practice for the selection of subcontractors'.
- List: Provide details of all subcontractors and the work for which they will be responsible.
- Submit: within one week of request.

A31 PROVISION, CONTENT AND USE OF DOCUMENTS

DEFINITIONS AND INTERPRETATIONS

110 DEFINITIONS
- Meaning: Terms, derived terms and synonyms used in the preliminaries/ general conditions and specification are as stated therein or in the appropriate British Standard or British Standard glossary.

120 COMMUNICATION
- Definition: Includes advise, inform, submit, give notice, instruct, agree, confirm, seek or obtain information, consent or instructions, or make arrangements.
- Format: In writing to the person named in clause A10/140 unless specified otherwise.
- Response: Do not proceed until response has been received.

130 PRODUCTS
- Definition: Materials, both manufactured and naturally occurring, and goods, including components, equipment and accessories, intended for the permanent incorporation in the Works.
- Includes: Goods, plant, materials, site materials and things for incorporation into the Works.

135 SITE EQUIPMENT
- Definition: All appliances or things of whatsoever nature required in or about the construction for completion of the Works but not materials or other things intended to form or forming part of the Permanent Works.
- Includes: Construction appliances, vehicles, consumables, tools, temporary works, scaffolding, cabins and other site facilities.

140 DRAWINGS
- Definitions: To BSRIA BG 6/2006 A design framework for building services. Design activities and drawing definitions.
- CAD data: In accordance with BS 1192.

170 MANUFACTURER AND PRODUCT REFERENCE
- Definition: When used in this combination:
  - Manufacturer: The firm under whose name the particular product is marketed.
  - Product reference: The proprietary brand name and/ or reference by which the particular product is identified.
  - Currency: References are to the particular product as specified in the manufacture's technical literature current on the date of the invitation to tender.

200 SUBSTITUTION OF PRODUCTS
- Products: If an alternative product to that specified is proposed, obtain approval before ordering the product.
- Reasons: Submit reasons for the proposed substitution.
- Documentation: Submit relevant information, including:
  - manufacturer and product reference;
  - cost;
  - availability;
  - relevant standards;
  - performance;

- function;
- compatibility of accessories;
- proposed revisions to drawings and specification;
- compatibility with adjacent work;
- appearance;
- copy of warranty/ guarantee.

- Alterations to adjacent work: If needed, advise scope, nature and cost.
- Manufacturers' guarantees: If substitution is accepted, submit before ordering products.

210 CROSS REFERENCES
- Accuracy: Check remainder of the annotation or item description against the terminology used in the section or clause referred to.
- Related terminology: Where a numerical cross-reference is not given the relevant sections and clauses of the specification will apply.
- Relevant clauses: Clauses in the referred to specification section dealing with general matters, ancillary products and execution also apply.
- Discrepancy or ambiguity: Before proceeding, obtain clarification or instructions.

220 REFERENCED DOCUMENTS
- Conflicts: Specification prevails over referenced documents.

230 EQUIVALENT PRODUCTS
- Inadvertent omission: Wherever products are specified by proprietary name the phrase 'or equivalent' is to be deemed included.

240 SUBSTITUTION OF STANDARDS
- Specification to British Standard or European Standard: Substitution may be proposed complying with a grade or category within a national standard of another Member State of the European Community or an international standard recognised in the UK.
- Before ordering: Submit notification of all such proposals.
- Documentary evidence: Submit for verification when requested as detailed in clause A31/200. Any submitted foreign language documents must be accompanied by certified translations into English.

250 CURRENCY OF DOCUMENTS
- Currency: References to published documents are to the editions, including amendments and revisions, current on the date of the Invitation to Tender.

DOCUMENTS PROVIDED ON BEHALF OF EMPLOYER

410 ADDITIONAL COPIES OF THE DRAWINGS/ DOCUMENTS
- Two copies of documents will be issued to the Contractor for construction purposes additional copies will be issued on request and charged to the Contractor.

440 DIMENSIONS
- Scaled dimensions: Do not rely on.

A31 PROVISION, CONTENT AND USE OF DOCUMENTS

460 THE SPECIFICATION
- Coordination: All sections must be read in conjunction with Main Contract Preliminaries/ General conditions.

470 DIVERGENCE FROM THE STATUTORY REQUIREMENTS
- Divergence: Between the drawings or specification and the requirements of the Building Regulations, other Statutes, statutory undertakers and other regulatory authorities.
- Action: Inform immediately.

DOCUMENTS PROVIDED BY CONTRACTOR/ SUBCONTRACTORS/ SUPPLIERS

610 PRODUCTION INFORMATION
- Contractor/ Domestic subcontractor provide prior to manufacture / fabrication.
- Submit:
  - For comment and make any necessary amendments.
  - Sufficient copies of final version for distribution to all affected parties.

630 TECHNICAL LITERATURE
- Information: Keep on site for reference by all supervisory personnel:
  - Manufacturers' current literature relating to all products to be used in the Works.
  - Relevant British Standards.

A 32 MANAGEMENT OF THE WORKS

GENERALLY

110 SUPERVISION
- General: Accept responsibility for coordination, supervision and administration of the Works, including subcontracts.
- Coordination: Arrange and monitor a programme with each subcontractor, supplier, local authority and statutory undertaker, and obtain and supply information as necessary for coordination of the work.

120 INSURANCE
- Documentary evidence: Submit details before starting work on site and/ or policies and receipts for the insurances required by the Conditions of Contract.

130 INSURANCE CLAIMS
- Notice: If any event occurs which may give rise to any claim or proceeding in respect of loss or damage to the Works or injury or damage to persons or property arising out of the Works, immediately give notice to the Employer, the person named in clause A10/140 and the Insurers.
- Failure to notify: Indemnify the Employer against any loss, which may be caused by failure to give such notice.

150 OWNERSHIP
- Alteration/ clearance work: Materials arising become the property of the Contractor except where otherwise stated. Remove from site as work proceeds.

PROGRAMME/ PROGRESS

210 PROGRAMME
- Master programme: When requested and before starting work on site, submit in an approved form a master programme for the Works.

230 SUBMISSION OF PROGRAMME
- Further information: Submission of the programme will not relieve the Contractor of the responsibility to advise of the need for further drawings or details or instructions in accordance with the Contract.

240 COMMENCEMENT OF WORK
- Notice: Before the proposed date for commencement of work on site give minimum notice of 2 weeks.

250 MONITORING
- Progress: Record on a copy of the programme kept on site.
- Avoiding delays: If any circumstances arise which may affect the progress of the Works submit proposals or take other action as appropriate to minimize any delay and to recover any lost time.

260 SITE MEETINGS
- General: Site meetings will be held to review progress and other matters arising from administration of the Contract.
- Frequency: To be agreed.
- Location: On site.
- Accommodation: Ensure availability at the time of such meetings.

- Attendees: Attend meetings and inform subcontractors and suppliers when their presence is required.
- Chairperson (who will also take and distribute minutes): the person named in Clause A10/140.

265 CONTRACTOR'S PROGRESS REPORT
- General: Submit a progress report at least two working days before the site meeting.
- Content: Notwithstanding the Contractor's obligations under the Contract the report must include:
  - A progress statement by reference to the master programme for the Works.
  - Details of any matters materially affecting the regular progress of the Works.
  - Subcontractors' and suppliers' progress reports.
  - Any requirements for further drawings or details or instructions.

290 NOTICE OF COMPLETION
- Requirement: Give notice of the anticipated dates of completion of the whole or parts of the Works.
- Associated works: Ensure necessary access, services and facilities are complete.
- Period of notice (minimum): 2 weeks.

310 EXTENSIONS OF TIME
- Notice: When a notice of the cause of any delay or likely delay in the progress of the Works is given under the Contract, written notice must also be given of all other causes which apply concurrently.
- Details: As soon as possible, submit:
  - Relevant particulars of the expected effects, if appropriate related to the concurrent causes.
  - An estimate of the extent, if any, of the expected delay in the completion of the Works beyond the Date for Completion.
  - All other relevant information required.

CONTROL OF COST

410 CASH FLOW FORECAST
- Submission: Before starting work on site submit a forecast showing the gross valuation of the Works at the date of each Interim Certificate throughout the Contract period and based upon the programme for the Works.

420 REMOVAL/ REPLACEMENT OF EXISTING WORK
- Extent and location: Agree before commencement.
- Execution: Carry out in ways that minimize the extent of work.

430 PROPOSED INSTRUCTIONS
- Estimates: If a proposed instruction requests an estimate of cost, submit without delay and in any case within seven days.
- Include:
  - A detailed breakdown of the cost, including any allowance for direct loss and expense.
  - Details of any additional resources required.
  - Details of any adjustments to be made to the programme for the Works.

- Any other information as is reasonably necessary to fully assess the implications of issuing such an instruction.
- Inability to comply: Inform immediately if it is not possible to comply with any of the above requirements.

440 MEASUREMENT
- Covered work: Give notice before covering work required to be measured.

450 DAYWORK VOUCHERS
- Before commencing work: Give reasonable notice to person countersigning daywork vouchers.
- Content: Before delivery, each voucher must be:
  - Referenced to the instruction under which the work is authorized.
  - Signed by the Contractor's person in charge as evidence that the operatives' names, the time daily spent by each and the equipment and products employed are correct.
- Submit: by the end of the week in which the work has been executed.

460 INTERIM VALUATIONS
- Applications: Include details of amounts requested under the Contract together with all necessary supporting information.
- Submission: At least seven days before established dates.

A33 QUALITY STANDARDS/ CONTROL

STANDARDS OF PRODUCTS AND EXECUTIONS

110 INCOMPLETE DOCUMENTATION
- General: Where and to the extent that products or work are not fully documented, they are to be:
  - Of a kind and standard appropriate to the nature and character of that part of the Works where they will be used.
  - Suitable for the purposes stated or reasonably to be inferred from the project documents.
  - Contract documents: Omissions or errors in description and/ or quantity shall not vitiate the Contract nor release the Contractor from any obligations or liabilities under the Contract.

120 WORKMANSHIP SKILLS
- Operatives: Appropriately skilled and experienced for the type and quality of work.
- Registration: With Construction Skills Certification Scheme.
- Evidence: Operatives must produce evidence of skills/ qualifications when requested.

130 QUALITY OF PRODUCTS
- Generally: New. (Proposals for recycled products may be considered).
- Supply of each product: From the same source or manufacturer.
- Whole quantity of each product required to complete the Works: Consistent in kind, size, quality and overall appearance.
- Tolerances: Where critical, measure a sufficient quantity to determine compliance.
- Deterioration: Prevent. Order in suitable quantities to a programme and use in appropriate sequence.

135 QUALITY OF EXECUTION
- Generally: Fix, apply, install or lay products securely, accurately, plumb, neatly and in alignment.
- Colour batching: Do not use different colour batches where they can be seen together.
- Dimensions: Check on-site dimensions.
- Finished work: Not defective, e.g. not damaged, disfigured, dirty, faulty, or out of tolerance.
- Location and fixing of products: Adjust joints open to view so they are even and regular.

140 COMPLIANCE
- Compliance with proprietary specifications: Retain on site evidence that the proprietary product specified has been supplied.
- Compliance with performance specifications: Submit evidence of compliance, including test reports indicating:
  - Properties tested.
  - Pass/ fail criteria.
  - Test methods and procedures.
  - Test results.
  - Identity of testing agency.
  - Test dates and times.
  - Identities of witnesses.
  - Analysis of results.

A33 QUALITY STANDARDS/ CONTROL

150 INSPECTIONS
- Products and executions: Inspection or any other action must not be taken as approval unless confirmed in writing referring to:
  - Date of inspection.
  - Part of the work inspected.
  - Respects or characteristics which are approved.
  - Extent and purpose of the approval.
  - Any associated conditions.

160 RELATED WORK
- Details: Provide all trades with necessary details of related types of work. Before starting each new type or section of work ensure previous related work is:
  - Appropriately complete.
  - In accordance with the project documents.
  - To a suitable standard.
  - In a suitable condition to receive the new work.
- Preparatory work: Ensure all necessary preparatory work has been carried out.

170 MANUFACTURER'S RECOMMENDATIONS/ INSTRUCTIONS
- General: Comply with manufacturer's printed recommendations and instructions current on the date of the Invitation to tender.
- Changes to recommendations or instructions: Submit details.
- Ancillary products and accessories: Use those supplied or recommended by main product manufacturer.
- Agrément certified products: Comply with limitations, recommendations and requirements of relevant valid certificates.

180 WATER FOR THE WORKS
- Mains supply: Clean and uncontaminated.
- Other: Do not use until:
  - Evidence of suitability is provided.
  - Tested to BS EN 1008 if instructed.

SAMPLES/ APPROVALS

210 SAMPLES
- Products or executions: Comply with all other specification requirements and in respect of the stated or implied characteristics either:
  - To an express approval.
  - To match a sample expressly approved as a standard for the purpose.

220 APPROVAL OF PRODUCTS
- Submissions, samples, inspections and tests: Undertake or arrange to suit the Works programme.
- Approval: Relates to a sample of the product and not to the product as used in the Works. Do not confirm orders or use the product until approval of the sample has been obtained.
- Complying sample: Retain in good, clean condition on site. Remove when no longer required.

230 APPROVAL OF EXECUTION
- Submissions, samples, inspections and tests: Undertake or arrange to suit the Works programme.
- Approval: Relates to the stated characteristics of the sample. (If approval of the finished work as a whole is required this is specified separately). Do not conceal, or proceed with affected work until compliance with requirements is confirmed.
- Complying sample: Retain in good, clean condition on site. Remove when no longer required.

SUPERVISION/ INSPECTION/ DEFECTIVE WORK

510 SUPERVISION
- General: In addition to the constant management and supervision of the Works provided by the Contractor's person in charge, all significant types of work must be under the close control of competent trade supervisors to ensure maintenance of satisfactory quality and progress.
- Replacement: Give maximum possible notice before changing person in charge or site agent.

525 ACCESS
- Extent: Provide at all reasonable times access to the Works and to other places of the Contractor or subcontractors where work is being prepared for the Contract.
- Designate: Contract Administrator and all members of the Design Team.

530 OVERTIME WORKING
- Notice: Prior to overtime being worked, submit details of times, types and locations of work to be done.
  - Minimum period of notice: Two working days.
- Concealed work: If executed during overtime for which notice has not been given, it may be required to be opened up for inspection and reinstated at the Contractor's expense.

540 DEFECTS IN EXISTING WORK
- Undocumented defects: When discovered, immediately give notice. Do not proceed with affected related work until response has been received.
- Documented remedial work: Do not execute work which may:
  - Hinder access to defective products or work; or
  - Be rendered abortive by remedial work.

550 ACCESS FOR INSPECTION
- Removal: Before removing scaffolding or other facilities for access, give notice of not less than four working days.

560 TESTS AND INSPECTIONS
- Timing: Agree and record dates and times of tests and inspections to enable all affected parties to be represented.
- Confirmation: One working day prior to each such test or inspection. If sample or test is not ready, agree a new date and time.
- Records: Submit a copy of test certificates and retain copies on site.

A33 QUALITY STANDARDS/ CONTROL

610 PROPOSALS FOR RECTIFICATION OF DEFECTIVE PRODUCTS/ EXECUTIONS

- Proposals: Immediately any execution or product is known, or appears, to be not in accordance with the Contract, submit proposals for opening up, inspection, testing, making good, adjustment of the Contract Sum, or removal and re-execution.
- Acceptability: Such proposals may be unacceptable and contrary instructions may be issued.

620 MEASURES TO ESTABLISH ACCEPTABILITY

- General: Wherever inspection or testing shows that the work, materials or goods are not in accordance with the contract and measures (e.g. testing, opening up, experimental making good) are taken to help in establishing whether or not the work is acceptable, such measures:
  - Will be at the expense of the Contractor.
  - Will not be considered as grounds for extension of time.

630 QUALITY CONTROL

- Procedures: Establish and maintain to ensure that the Works, including the work of subcontractors, comply with specified requirements.
- Records: Maintain full records, keep copies on site for inspection, and submit copies on request.
- Content of records:
  - Identification of the element, item, batch or lot including location in the Works.
  - Nature and dates of inspections, tests and approvals.
  - Nature and extent of nonconforming work found.
  - Details of corrective action.

WORK AT OR AFTER COMPLETION

710 WORK BEFORE COMPLETION

- General: Make good all damage consequent upon the Works.
- Temporary markings, coverings and protective wrappings: Remove unless otherwise instructed.
- Cleaning: Clean the Works thoroughly including all accessible ducts and voids. Remove all splashes, deposits, efflorescence, rubbish and surplus materials.
- Cleaning materials and methods: As recommended by manufacturers of products being cleaned, and must not damage or disfigure other materials or construction.
- COSHH dated data sheets: Obtain for all materials used for cleaning and ensure they are used only as recommended by their manufacturers.

720 SECURITY AT COMPLETION

- General: Leave the Works secure with, where appropriate, all accesses closed and locked.

730 MAKING GOOD DEFECTS

- Remedial work: Arrange access with Employer.
- Rectification: Give reasonable notice for access to the various parts of the Works.
- Completion: Notify when remedial works have been completed.

A34 SECURITY/ SAFETY/PROTECTION

SECURITY, HEALTH AND SAFETY

110 PRECONSTRUCTION INFORMATION
- Location: Refer to separate tender documentation and project Preliminaries, including but not restricted to the following sections:
  - Description of project: Sections A10 and A11.
  - Client's consideration and management requirements: Sections A12, A13 and A36.
  - Environmental restrictions and on-site risks: Section A12, A34 and A35.
  - Significant design and construction hazards: Section A34.
  - The Health and Safety File: Section A37.

120 EXECUTION HAZARDS
- Common hazards: Not listed. Control by good management and site practice.
- Significant hazards:
  - The museum and gardens will remain open to the public for the duration of the contract and are particularly popular with school parties.
  - Vehicular access is from Horniman Drive then through the gardens. Contractor to comply with museum guidelines which are issued as an appendix to these preliminaries
  - Works will be being undertaken by another contractor (under a separate contract) in areas of the Museum above and adjacent to the works area
  - Working at height on soffits
  - The contractor is responsible for managing the fire risk within the work area – contractor to agree fire management and protection plan with the Horniman Museum and the Principal Designer prior to commencing on site.
  - The contractor is to review the Horniman Museum and Gardens asbestos register prior to commencement on site. Should the contactor identify any potential asbestos containing materials during the course of their works they are to cease work in this area and report the findings to the Horniman Museum, Principal Designer, and Contract Administrator.
    See also section 370 below.

130 PRODUCT HAZARDS
- Hazardous substances: Site personnel levels must not exceed occupational exposure standards and maximum exposure limits stated in the current version of HSE document EH40: Occupational Exposure Limits.
- Common hazards: Not listed. Control by good management and site practice.

140 CONSTRUCTION PHASE HEALTH AND SAFETY PLAN
- Submission: Present to the Principal Designer no later than two weeks before the proposed start on site.
- Confirmation: Do not start construction work until the Employer has confirmed in writing that the Construction Phase Health and Safety Plan includes the procedures and arrangements required by CDM Regulations.
- Content: Develop the plan from and draw on the Outline Construction Phase Health and Safety Plan, clause A30/570, and the Preconstruction information.

150 SECURITY
- Protection: Safeguard the site, the Works, products, materials, and any existing buildings affected by the Works from damage and theft.
- Access: Take all reasonable precautions to prevent unauthorized access to the site, the Works and adjoining properties.
- The Horniman Museum and Gardens are to remain secure at all times and contractor will be responsible for ensuring this should they undertake work out of Horniman Museum opening hours.

A34 SECURITY/ SAFETY/PROTECTION

160 STABILITY
- Responsibility: Maintain the stability and structural integrity of the Works and adjacent structures during the Contract.
- Design loads: Obtain details, support as necessary and prevent overloading.

170 OCCUPIED PREMISES
- Extent: The museum and gardens will remain open to the public for the duration of the contract.
- Works: Carry out without causing undue inconvenience and nuisance to museum staff and members of the public and without danger to all occupants of and visitors to the museum and gardens.

- The Contractor's operations are to be confined to the areas indicated on the drawings and access to any other parts of the building or gardens is not permitted. If access is required to any other areas then appointment should be made through the Contract Administrator giving at least 48 hours notice.

- Overtime: If compliance with this clause requires certain operations to be carried out during overtime, and such overtime is not required for any other reason, the extra cost will be paid to the Contractor, provided that such overtime is authorised in advance by the Contract Administrator.

210 EMPLOYER'S REPRESENTATIVES SITE VISITS
- Safety: Submit details in advance, to the Employer or the person identified in clause A10/140, of safety provisions and procedures (including those relating to materials, which may be deleterious), which will require their compliance when visiting the site.
- Protective clothing and/ or equipment: Provide and maintain on site for the Employer and the person stated in clause A10/140 and other visitors to the site.

PROTECT AGAINST THE FOLLOWING

330 NOISE CONTROL
- Standard: Comply generally with the procedures set out in BS5228:1997 Parts 1-5 'Noise Control on Construction and Open Sites to minimise noise levels during execution of the Works.
- Equipment: Fit compressors, percussion tools and vehicles with effective silencers of a type recommended by manufacturers of the compressors, tools or vehicles.
- Restrictions: Do not use:
  - Pneumatic drills and other noisy appliances without consent.
  - Radios or other audio equipment

340 POLLUTION
- Prevention: Protect the site, the Works and the general environment against pollution.

350 PESTICIDES
- Use: Not permitted.

360 NUISANCE
- Duty: Prevent nuisance from smoke, dust, rubbish, vermin and other causes.

A34 SECURITY/ SAFETY/PROTECTION

370 ASBESTOS CONTAINING MATERIALS
- Duty: Report immediately any suspected materials discovered during execution of the Works.
  - Do not disturb.
  - Agree methods for safe removal or encapsulation

380 FIRE PREVENTION
- Duty: Prevent personal injury or death, and damage to the Works or other property from fire.
- Standard: Comply with Joint Code of Practice 'Fire Prevention on Construction Sites', published by the Construction Confederation and The Fire Protection Association (The 'Joint Fire Code').

390 SMOKING ON SITE
- Smoking on site: Not permitted.

400 BURNING ON SITE
- Burning on site: Not permitted.

430 WASTE
- Includes: Rubbish, debris, containers and surplus material.
- Minimize: Keep the site and Works clean and tidy.
- Remove: Frequently and dispose off site in a safe and competent manner:
  - Non-hazardous material: In a manner approved by the Waste Regulation Authority.
  - Hazardous material: As directed by the Waste Regulation Authority and in accordance with relevant regulations.
- Voids and cavities in the construction: Remove rubbish, dirt and residues before closing in.
- Waste transfer documentation: Retain on site.

440 ELECTROMAGNETIC INTERFERENCE
- Duty: Prevent excessive electromagnetic disturbance to apparatus outside the site.

460 POWER ACTUATED FIXING SYSTEMS
- Use: Not permitted.

PROTECT THE FOLLOWING

510 EXISTING SERVICES
- Identification: Before starting work, check and mark positions of mains/ services. Where positions are not shown on drawings obtain relevant details from service authorities, statutory undertakers or other owners.
- Work adjacent to services:
  - Comply with service authority's/ statutory undertaker's recommendations.
  - Adequately protect, and prevent damage to services: Do not interfere with their operation without consent of service authorities/ statutory undertakers or other owners.
- In respect of the removal, relocation and reinstatement of electrical services to the underside of the filler joist soffits within the works area, which are included within the contractors scope of works. The contractor is to undertake the necessary surveys and inspections to ensure that they are fully aware of the nature and location of such services. All electrical works are to be undertaken and certified

by an appropriately qualified professional and the reinstated electrical services are to comply with current standards and regulations.

520 ROADS AND FOOTPATHS
- Duty: Maintain roads and footpaths within and adjacent to the site and keep clear of mud and debris.
- Damage caused by site traffic or otherwise consequent upon the Works: Make good to the satisfaction of the Employer, Local Authority or other owner.

560 EXISTING FEATURES
- Protection: Prevent damage to existing buildings, fences, gates, walls, roads, paved areas and other site features, which are to remain in position during execution of the Works.

570 EXISTING WORK
- Protection: Prevent damage to existing work, structures or other property during the course of the work.
- Removal: Minimum amount necessary.
- Replacement work: To match existing.

580 BUILDING INTERIORS AND CONTENTS
- Protection: To be provided to contain dust and debris within the work areas and to prevent other areas of the museum and gardens being affected by the works.

625 ADJOINING PROPERTY RESTRICTIONS
- Precautions:
  - Prevent trespass of workpeople and take precautions to prevent damage to adjoining property.
  - Pay all charges.
  - Remove and make good on completion or when directed.
  - Damage: Bear cost of repairing damage arising from execution of the Works.

630 EXISTING STRUCTURE
- Duty: Check proposed methods of work for effects on adjacent structure.
- Supports: During execution of the Works:
  - Provide and maintain all incidental shoring, strutting, needling and other supports as may be necessary to preserve stability of existing structure that may be endangered or affected by the Works.
  - Do not remove until new work is strong enough to support existing structure.
  - Prevent overstressing of completed work when removing supports.
- Adjacent structure: Monitor and immediately report excessive movement.
- Standard: Comply with BS 5975 and BS EN 12812.

A35 SPECIFIC LIMITATIONS ON METHOD/ SEQUENCE/ TIMING

110 SCOPE

- General: The limitations described in this section are supplementary to limitations described or implicit in information given in other sections or on the drawings.

140 SCAFFOLDING

- Scaffolding: Make available to subcontractors and others at all times.

160 USE OR DISPOSAL OF MATERIALS

- Specific limitations: There shall be no storage of materials outside the designated site area.

170 WORKING HOURS

- Monday to Friday - 7.00am to 6.00pm
  Saturday - 9.00am to 1.00pm
  No work on Sundays or Bank Holidays
- **Noisy works in the two offices adjacent to the nature base exhibition space (North end of works area) are restricted to the hours of 8am – 10.30am.**
  No work must be executed outside these hours without prior approval.
- Wherever possible deliveries to and from the site should take place between the hours 7.30am and 10.30am.

A36 FACILITIES/ TEMPORARY WORKS/ SERVICES

GENERALLY

110 TEMPORARY WORKS AND SERVICES

- The Contractor should not use any of the other toilets located in the museum and gardens.
- The Horniman Museum is investigating the possibility of making one car park space available behind the North Hall for locating a skip if required. Although this will have to be incorporated into the contractors materials storage area. To be advised by the Horniman Museum prior to commencement of the contract.

TEMPORARY WORKS

330 TEMPORARY PROTECTION TO BUILDING INTERIORS AND CONTENTS
- Temporary protection: Provide before starting work as clause A34/580 (refer also to the work schedules)
- Integrity of protection: Maintain for the duration of the Works. Remove on completion of the works and make good disturbed area.

340 NAME BOARDS/ ADVERTISEMENTS
- General: Obtain approval before displaying any nameboards.

SERVICES AND FACILITIES

440 TELEPHONES
- Temporary on site telephone: Provide as soon as practicable after the start on site for joint use by the Contractor, Subcontractors and those acting on behalf of the Employer, and pay all charges reasonably incurred.
- Responses: Make arrangements to ensure that incoming calls are answered promptly.
- Employer's call charges: Allow for the cost of a modest number of calls made by those acting on behalf of the Employer.

540 METER READINGS
- Charges for service supplies: Where to be apportioned ensure that:
  - Meter readings are taken by relevant authority at possession and/ or completion as appropriate.
  - Copies of readings are supplied to interested parties.

570 PERSONAL PROTECTIVE EQUIPMENT
- General: Provide for the sole use of those acting on behalf of the Employer:
  - Safety helmets to BS EN 397, neither damaged nor time expired. Number required: 6
  - High visibility waistcoats to BS EN 471 Class 2. Number required: 6

A37 OPERATION/ MAINTENANCE OF THE FINISHED BUILDING

GENERALLY

150 CONSTRUCTION PHASE PLAN
- Responsibility: the contractor.
- Delivery to: Principal Designer – to be received by Principal Designer 2 weeks prior to commencement on site.

160 THE HEALTH AND SAFETY FILE
- Responsibility: the contractor.
- Content: Obtain and provide the following information: A record containing information relating to the project which is likely to be needed during any subsequent construction work to ensure the health and safety of any person.
- Format: A4 size, plastics covered, loose leaf, four ring binders with hard covers, each indexed, divided and appropriately cover titled.
- Selected drawings needed to illustrate or locate items mentioned in the
- Delivery to: Principal Designer – Draft to be received by Principal Designer 4 weeks prior to completion of the contract.

A40 CONTRACTOR'S GENERAL COST ITEMS: MANAGEMENT AND STAFF

110 MANAGEMENT AND STAFF

- Cost significant items:

- Insert below cost items as may be required with fixed charges and time related charges as appropriate.

A41 CONTRACTOR'S GENERAL COST ITEMS: SITE ACCOMMODATION

110 SITE ACCOMMODATION

- Details: Site accommodation required – available space for locating to be agreed with Horniman Museum and Gardens Estate Manager – Tim Hopkins (see section A10 for contact details)
- Cost significant items:

  Insert below cost items as may be required with fixed charges and time related charges as appropriate.

A42 CONTRACTOR'S GENERAL COST ITEMS: SERVICES AND FACILITIES

110 SERVICES AND FACILITIES
- Details: Services or facilities required or made/ not made available by the Employer: See section A36.
- Cost significant items: Insert costs below for items as may be required with fixed charges and time related charges as appropriate.

115 POWER

120 LIGHTING

130 FUELS (Excluding fuels for testing and commissioning)

140 WATER

150 TELEPHONE AND ADMINISTRATION

160 SAFETY, HEALTH AND WELFARE

170 STORAGE OF MATERIALS

180 RUBBISH

190 CLEANING

200 DRYING OUT

210 PROTECTION OF WORK IN ALL SECTIONS

220 SECURITY

230 MAINTAIN PUBLIC AND PRIVATE ROADS

240 SMALL PLANT AND TOOLS

310 ADDITIONAL SERVICES AND FACILITIES ITEMS: (Insert below further cost items as may be required, with fixed charges and time related charges as appropriate

A43 CONTRACTOR'S GENERAL COST ITEMS: MECHANICAL PLANT

110 MECHANICAL PLANT
- Cost significant items:

Insert below items as may be required with fixed charges and time related charges as appropriate.

A44 CONTRACTOR'S GENERAL COST ITEMS: TEMPORARY WORKS

110 TEMPORARY WORKS

- Details: Temporary works required or made/ not made available by the Employer: See section A36.
- Cost significant items:

  Insert below items as may be required with fixed charges and time related charges as appropriate.

A55 DAYWORKS AND CONTINGENCIES

110 LABOUR

- Provisional sum: Include prime cost of labour incurred before the Final Completion Date: **£2,000.00**. £2,000.00
  - Percentage adjustment: Add to cover incidental costs, overheads and profit: _____ %.
- Provisional sum: Include prime cost of labour incurred after the Final Completion Date: **£1,000.00.** £1,000.00
  - Percentage adjustment: Add to cover incidental costs, overheads and profit: _____ %.

120 PRODUCTS

- Provisional sum: Include prime cost incurred at any time during the Contract **£2,000.00**. £2,000.00
  - Percentage adjustment to cover incidental costs, overheads and profit: _____ %.

130 EQUIPMENT

- Provisional sum: Include prime cost of plant (equipment) incurred before the Final Completion Date **£1,000.00**. £1,000.00
  - Percentage adjustment to cover incidental costs, overheads and profit: _____ %.
- Provisional sum: Include prime cost of plant (equipment) incurred after the Final Completion Date: **£1,000.00**. £1,000.00
  - Percentage adjustment to cover incidental costs, overheads and profit _____ %.
- Plant (equipment) costs: Rates set out in the Schedule of Basic Plant Charges published by the RICS current at the Date of Tender.

150 CONTINGENCY £5,000.00

- Include the provisional sum of **£5,000**

COLLECTION	£ - p
Page No	
A10/1	
A11/1	
A12/1	
A12/2	
A13/1	
A20/1	
A20/2	
A20/3	
A20/4	
A20/5	
A30/1	
A30/2	
A30/3	
A31/1	
A31/2	
A31/3	
A32/1	
A32/2	
A32/3	
A33/1	
A33/2	
A33/3	
A33/4	
A34/1	
A34/2	
A34/3	
A34/4	
A35/1	
A36/1	
A37/1	
A40/1	
C/Fwd	

COLLECTION

£ - p

Page No

B/Fwd

A41/1

A42/1

A43/1

A44/1

A55/1

PRELIMINARIES - TO PART D GENERAL SUMMARY

APPENDICES TO PRELIMINARIES

Museum Rules for Visiting Contractors

HORNIMAN MUSEUM & GARDENS

Museum Rules for Visiting Contractors

This sheet sets out the Museum rules for all visiting contractors, and should be issued to every person for information.

We are required under the Health and Safety at Work etc. Act 1974 to ensure that a safe place of work exists for all those who have cause to use the premises: this duty extends to not only staff and visitors but other users, including contractors.

It is the responsibility of every contractor to ensure that his site supervisor receives a copy of these rules and that his employees are informed of those rules which affect them.

These rules are not negotiable and the Museum requires, as part of the work contract, that they are strictly adhered to.

Any wilful ignoring of these rules will result in the person being banned from the Museum site and any further breach may result in the company being barred from any further work for the Museum.

Parking

As there is limited space onsite the Museum cannot guarantee to provide contractor parking and staff attending site should be informed of this and advised that they may need to park offsite. If there is equipment to unload the Museum should be informed in advance and arrangements can be made for short term parking on site. Vehicles should then be removed from the site unless tools and equipment that is essential to their operation are kept and accessed in the vehicle.

Identification badges work permits and keys

Every person must wear the prescribed Museum identification badge /work permit in a prominent position at all times when in the Museum. The badge/permit/key/swipe card will be issued at the security desk on arrival and must be returned on departure. The badges/permits/keys/ swipe cards must not be taken ‘off site’ and must be handed in whenever leaving the Museum. Failure to comply may result in permission to work on site being refused.

Smoking

No smoking except in the designated location is permitted anywhere in the Museum at any time, including courtyard areas.

Hot Works, Working at Height (over 2 metres), Electrical Work

All works which have any element as above must be agreed in advance with the Estates Manager or Deputy Facilities Manager and a Permit to Work obtained from the security desk. This may also require isolation of the fire alarm system prior to the commencement of any hot ‘work’. Work may not commence until this precaution has been confirmed by Security.

Suitable risk assessments should be available as required by the Work at Height regulations 2005.

Any contractor refusing to complete a work permit will not be permitted to work on site.

Any deactivation of alarms should be logged in the security log book.

Equipment brought on site

All equipment used by a Contractor or Supplier must comply with appropriate safety and electrical legislation.

Equipment left on site shall be kept in a safe and secure manner and at the risk of the Contractor or Supplier.

All portable appliances used outside of buildings and on construction sites should, where possible, be battery operated or suitable for use with 110 volt power supply.

Personal protection

Hard hats will be worn wherever risk of head injury exists, both inside and outside of the buildings. Contractors should ensure they wear appropriate personal protective clothing and footwear.

Competence
The Principal Contractor is required to check the competence of any domestic named or nominated contractor for the purposes of complying with the Construction (Design and Management) Regulations 2015.

Contractors and self-employed people
Where applicable, it is a requirement under the Construction (Design and Management) Regulations 2015, the Principal Contractor (the principle contractor manages the construction phase plan, contractors and designers will be appointed) ensures contractors and self-employed people working on the site are made aware of the relevant portions of the Health and Safety plan. All contractors must ensure that full induction of his/her own staff, sub-contractors staff and the self-employed is carried out and that these site rules are fully understood by all persons employed on site.

Food and drink

No food or drink of any type may be taken into, or consumed within the Museum.

Radios

No radios, headphones or MP3 players may be used within the Museum or Gardens at any time.

Language

Foul, offensive or immoderate language is not acceptable within the Museum and Gardens at any time. Any wilful ignoring of this rule will result in the person being banned from the Museum site and any further breach may result in the company being barred from any further work for the Museum. In hot weather shirts must be kept on at all-time across the site.

Fire alarms and evacuations

Fire alarms are tested every Thursday morning between 07.00 and 09.00. They will sound for a few seconds only and then stop. This activation is repeated several times.

At all other times when the fire alarm sounds, all contractors must evacuate the building immediately by the nearest exit and gather in front of the clock tower.

The contractor must nominate a member of staff to be responsible for checking that all of the staff are clear of the building and report such to the nearest Visitor Services Assistant who will relay the information to Incident Controller.

Contractors must not re-enter the building without permission from the Incident Controller.

Accidents

All accidents should be reported to the Security Desk. And the relevant forms filled in. Contractors should notify the museum of any known disability (e.g. hearing impairment, colour blindness) health condition or language difficulty which could affect their safety and/or the safety of others whilst undertaking work at the Museum.

Toilets

Contractors may use only the toilets designated by the Museum.

Access

All means of access must be agreed in advance by the Estates Manager or Deputy Facilities Manager. The normal access route is via the Horniman Drive gate. Contractors should be reminded of the rules while driving a vehicle on site and must be observed. Hazard warning lights should be on and the speed limit is 5 mph.

Materials

The delivery and storage of materials and the routes and times of entry into the Museum must be agreed with the Estates Manager or Deputy Facilities Manager in advance.

Rubbish

The Contractor is responsible for removing all unused materials and/or waste/recyclable materials by the completion of the works and at the end of each work period.

Work Site

Contractors should restrict their movements to the designated work site and agreed access routes.

Works

No work shall be carried out without the prior knowledge and agreement of the Facilities Manager or Deputy Facilities Manager.

Telephones

The Museum phone system is not to be used by Contractors except when it is crucial to the completion or continuation of works or in cases of emergency. It should also be noted that the use of mobile phones within the Museum building should not cause nuisance or annoyance to staff or visitors.

Late/Lone Working

Whilst every effort is made to ensure that works are carried out during the normal working day it is recognised that on occasion it may be necessary to undertake work out of hours. Any contractor working outside normal hours will be required to make use of the Museum's lone worker protection system and carry a Museum radio to stay in contact with Museum Security staff whilst onsite. Any failure to comply with this request will be refused permission to work onsite.

Any contractor or delivery person failing to take reasonable Health, Safety, and operational instruction from security staff or management will be told to leave the premises, their superiors will be informed and they will be banned from accessing the Horniman sites in future.

Declaration

I declare that I have fully read and understand this document. I agree to comply with the Rules and acquaint all persons employed by the Company (including sub-contracted staff) with these Safety Rules.

Signed……..

Date …….

Name (Block Capitals)…….

Position (Block Capitals)…….

Company Name (Block Capitals)……..

Revised March 2016 Quadriga. Reviewed April 2016 PW.

PART B

PREAMBLES / SPECIFICATIONS

Refer to Conisbee Specification Sheets and Drawings

PART C

WORKS SCHEDULES

					£ - p
	FILLER JOIST SOFFIT REPAIRS				
	General Notes				
	These work schedules are to be read in conjunction with the Preliminaries section of this document				
	Protection				
	Protection of any fixed cabinets, display cases, benches and services which cannot be removed from the work areas is to be undertaken by the client prior to commencement of the contract. However the tenderer should allow for:				
a	Protecting existing wood floors by means of polythene and hardboard to all access and work areas.		Item		
b	Provide protective screens to contain dust and debris within work areas and to prevent affecting other areas of the museum, its fixtures or fittings.		Item		
	Repair works all in accordance with Conisbee Drawings SSK001 and S101 (Note: Sequential or hit and miss repairs may be required)				
c	Remove and relocate electrical services mounted to the underside of the filler joist soffit and the abutment of the soffit and walls (see provisional sum in the general summary)				
d	Remove existing debris netting and battens to all soffits and dispose.		Item		
e	Hack off all plaster to expose concrete soffits of the offices to the North and South Halls, including where present removal and disposal of false / plasterboard ceilings.		Item		
f	Carry out visual and hammer test of concrete soffits and mark all defects for review with the Contract Administrator; defects to be recorded on drawings.		Item		
g	Delineate loose / debonded areas with a disc cutter		Item		
h	Remove defective concrete by mechanical means and expose filler joists (allow for full length of joist)		Item		
i	Prepare exposed filler joist and other embedded metal and paint with approved primer (allow for full length of joist).		Item		

			To Collection	£ - p
a	concrete on either side of joists using stainless steel screw fixings.		Item	
b	Apply approved bonding slurry and repair mortar using 'wet on wet' method level with original concrete surface leaving ready for plastering and redecoration		Item	
c	Once concrete repairs have fully cured apply undercoat plaster to soffit to prepare surface for finishing coat (undercoat plaster to be fully compatible with finishing plaster)		Item	
d	Apply finishing plaster to soffit in accordance with manufacturers instructions to achieve a smooth finish suitable for redecoration (Note: all ceiling levels to match the original)		Item	
e	Apply sealer or mist coat to suitably cured plaster soffit in preparation for redecoration		Item	
f	Prepare all walls, ceilings and previously painted skirtings and architraves for painting		Item	
g	Paint all walls, ceilings and previously painted skirtings and architraves as stipulated below Walls: Two coats of an approved water based acrylic paint- Magnolia, matt finish Ceilings: Two coats of an approved water based acrylic paint Brilliant white, matt finish Woodwork: White Gloss,satin finish			
h	Reinstate surface mounted electrical services previously relocated (see provisional sum in the General Summary)			
			To Collection	
	COLLECTION			

FILLER JOIST SOFFIT REPAIRS - TO PART D GENERAL SUMMARY **£**

PART D

GENERAL SUMMARY

GENERAL SUMMARY

	PAGE	£ - p
PART A - PRELIMINARIES	A6/2	
PART C - WORKS SCHEDULES	C/2	
ADD for all insurance not previously included in the Preliminaries section of this document		
ADD for water for the works		
ADD for all liabilities incurred by the National Insurance Act for any other Act of Parliament of a like nature, pensions and holidays with pay scheme		
ADD Provisional sum for electrical enabling works to remove and relocate electrical services mounted to the soffits to be repaired and reinstate after completion of the soffit repairs		5,000.00
TO FORM OF TENDER	**£**	

APPENDIX B – PREVIOUS REPORTS

- CONISBEE TECHNICAL REPORT
(REF:070283/SP/GJ – 1.1 FINAL)

conisbee

Horniman Museum and Gardens

Fabric Testing and Safety Works

FINAL REPORT

Consulting Structural Engineers
Consulting Civil Engineers

1–5 Offord St London N1 1DH
Telephone 020 7700 6666
Fax 020 7700 6686

design@conisbee.co.uk
www.conisbee.co.uk

Ref: 070283/SP/GJ
Date: 17 April 2009
Rev No: Rev. 1.1 FINAL

conisbee

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 The Horniman Museum was opened in 1901 and has undergone various changes since most notably in 1911 with the addition of a new building and 1999 with the demolition and redevelopment of parts of the structure as part of a lottery funding heritage scheme. The Museum comprises the North and South exhibition halls, laboratories and offices to the East of the Halls, the modern addition opened in 2002 (exhibition areas and visitor facilities), the stone clock tower and stairs to the South of the museum which houses the main entrance lobby and various other buildings including the iron and glass conservatory to the North of the main museum buildings.
The areas of structure investigated as part of these works are within the original structure which generally comprises solid brickwork walls, filler joist floor and balcony slabs with barrel roofs to the exhibition halls and a combination of flat and pitched roofs throughout the rest of the structure.

1.2 Following spalling of render and plaster to the North Hall Balcony Conisbee were appointed to inspect the balcony and assess its condition. The findings and recommendations resulting from this inspection are contained in the Conisbee report reference 070283/D Crous dated 17 July 2008. This report is contained in Appendix A of this report. As a consequence of this initial report representatives from Conisbee and the Horniman Museum and Gardens (HM&G) met to discuss the issues raised and the implications for the maintenance of the structure. This resulted in Conisbee submitting detailed recommendations and a way forward for dealing with the potential structural and durability issues identified. These recommendations detailed a three phase inspection, assessment and repair strategy which is outlined in the letter report reference 070283/GJ dated 07 August 2008 and this forms Appendix A of this report. Reference plans and drawings highlighting the various areas and elements of the structure are contained within Appendix B.

1.3 As a result of the phased strategy submitted to HM&G by Conisbee and a subsequent meeting with representatives from the HM&G Senior Management Team and Maintenance staff HM&G appointed Martech Technical Services Ltd (Martech) to undertake the first stage of the phased strategy which included safety survey, testing and investigation of the building fabric undertaken under the direction of Conisbee. These works were undertaken between 01 December 2008 and 09 January 2009 and the factual results available to date are contained in the Martech report reference 08103. Following our inspections and observations during the safety and investigation works and our appraisal of Martech's report we are able to report on the condition of the building fabric inspected and recommendations for the repair of defective areas and these findings and recommendations form the basis of this report. This report should be read in conjunction with the draft Martech report ref. 08103.

1.4 This report has been prepared for the client, The Horniman Museum and Gardens, and is for their sole use. No responsibility is accepted to any other party.

2 NATURE OF THE WORKS

Following our recommendation for further works HM&G instructed the following duties to be undertaken by Martech Technical Services, a specialist testing house, under the direction of Conisbee:

2.1 Safety Survey – These works comprised hammer tap survey of the entire soffit of the filler joist slab in the offices to both the first and second floors of the museum and the balcony soffits in the North and South Halls. This was in order to identify any areas of immediately loose or dangerous material. The loose/dangerous material was then removed, and clear polythene was stapled over the exposed areas of concrete in order to prevent dust falling into the room below. The rooms were then netted with debris netting fixed to the soffits with timber batons to prevent material falling from the soffit should it become detached prior to the implementation of a repair programme.

2.2 Testing and Investigation Works – Whilst undertaking the safety works areas of concrete were broken out and testing undertaken in order to establish the condition of the concrete and the filler joists within it. This was in order to establish the true cause and extent of the visible deterioration noted to the soffits and included visual inspection of the steel joists, carbonation and sulphate testing of the concrete, damp meter surveys, and level surveys of the balcony soffits adjacent to the West wall of the museum in the North and South halls.

2.3 Clock Tower Inspection – A visual inspection of the interior and exterior of the clock tower was undertaken along with some small areas of opening up around the fixings of the clock face as cracking and spalling of the stone was evident in these areas.

3 FINDINGS

3.1 Safety Survey and Soffit Encapsulation

The Safety works were primarily undertaken to the exposed soffits of the laboratories and offices however a visual survey to assess the state of the soffit above the false ceilings was also undertaken to the ground and first floor rooms/offices adjacent to the South Hall. An additional hammer tap survey of the balcony soffits in the North and South Halls was also undertaken.

3.1.1 Exposed Soffits

The safety works to the offices revealed large areas of loose and de-bonded render/plaster and concrete which if left unattended may have become detached and thus represented a significant health and safety risk particularly in the general office space and the natural history laboratories where large areas of loose render/plaster were removed. The areas of de-bonded render/plaster and concrete were commonly along the lines of the steel joists within the filer joist slabs. Such slabs commonly indicate cracking and de-bonding of the plaster along the line of the joist due to the initial shrinkage of the concrete and expansive corrosion of the steel joists. In the majority of the areas identified as hollow/de-bonded little force was required to remove the render/plaster indicating these areas were a significant health and safety risk prior to the works.

In general the render/plaster did not appear to have a very good key to the clinker concrete soffit and in a number of areas it remained intact only due to the horse hair content within the material bonding it together.

Following the removal of loose/dangerous material the areas of exposed soffit were encapsulated to retain any material which may become de-bonded in the future thus reducing the health and safety risk to personnel using these areas of the museum. This was achieved by fixing debris netting to the soffit with wooden batons which were plugged and screwed to the soffit and a chemical fixing used wherever a firm mechanical fixing could not be achieved into the clinker concrete. Prior to the installation of the netting polythene sheeting was fixed over areas of exposed filler joist or any other areas where dust particles may fall from the soffit into the work environment below.

3.1.2 Covered Soffits

The visual inspection of the soffits above the false ceilings within the offices and room around the tower revealed loose or de-bonded render/plaster as seen elsewhere within the structure, a number of areas the loose material appeared to have spalled off or been previously removed.

The areas of defective plaster and render were most severe within the security office and rooms behind the main reception area. Corrosion of the steel joists along with a beam supporting the timber single pitched roof the East of these rooms was also evident although this is unlikely to have had a detrimental affect on the structural performance of these elements.

3.1.3 Boiler Rooms

The boiler rooms to the North and South of the structure were visually inspected and revealed spalling of the render/plaster and concrete to the filler joist soffits. There were also a number of areas of exposed filler joist which exhibited signs of corrosion. The degree of corrosion in these areas is not deemed to be so significant that it has compromised the structural integrity of the slab.

3.1.4 Clock Tower External Inspection

The exterior of the clock tower was visually inspected by Martech using rope access techniques. The inspection did not reveal any significant structural issues although durability issues were identified which is to be expected considering the age and exposed location of the structure. Cracking and spalling was observed around a number of the clock face fixings to the South and East elevations of the tower. The areas of spalling and cracking were not as severe as those observed internally which are detailed in 3.2.6 below. There was no evidence of deterioration of the stonework due to corrosion of the filler joists. Cracking observed between the stone blocks appears to indicate movement of the towers foundations however as with the cracking identified internally this is believed to be historical movement and not structurally significant at this point in time.

The asphalt roof of the clock tower was noted to be cracked in a number of locations and Martech were asked to install flash banding over the cracks whilst they were on the roof undertaking the external visual inspection of the tower.

3.2 Testing and Investigation

The testing and investigation works were undertaken throughout the museum and the findings are summarised in relation to the following areas

3.2.1 Laboratories and Offices

The opening up works to the steel joists revealed most of the steel to exhibit some degree of corrosion. However, whilst the amount of corrosion product produced (~10mm) was substantial enough to cause cracking and de-bonding of the plaster and render it did not represent such a significant loss of section such that it has compromised the integrity of the structure. The worst corrosion was observed at test areas 12 and 15 in rooms G and J adjacent to the South Hall (see plans in Appendix D). These joists exhibited necking and thinning of the flanges. The walls in these areas were found to be significantly wet however on there was not always a specific correlation between the degree of corrosion and the moisture levels of the building fabric. Whilst the correlation between high moisture areas and the degree of corrosion may not be clearly evident there are moisture ingress/condensation issues throughout these rooms and this is or has previously contributed to the corrosion identified during these works. Some areas where the corrosion appears worse than the level of moisture would suggest may have been subjected to water ingress in the past which has since been addressed and the fabric of the structure dried out over time. Also see 3.2.7.

3.2.2 Carse Room

The opening up works in the Carse room concentrated on one area of opening up to the steel filler joists at the bearing into the external (East) wall. This revealed the steel, as in other areas of the museum, to exhibit corrosion of the steel and expansive corrosion product of ~10mm. As with the other areas the degree of corrosion was not severe enough to have significant structural implications.

In addition to the opening up detailed above cracking was observed to the wall between the Carse room and the Music offices. This was inspected and the plaster removed to the area around the crack within the music office. The removal of the plaster revealed a stepped crack through the mortar joints of the brick work. There was evidence of the fine cracking to the plaster at the crack location within the Carse room itself. However, as this cracking was fine and the Carse room was reported to have been last plastered ~10yrs ago any movement indicated by the cracking is deemed to be historical and not structurally significant at the present time.

3.2.3 North Hall Balcony

The North hall balcony soffit had been previously hammer tested by Conisbee and the areas of de-bonded/hollow plaster and render marked on the soffits. The current investigations therefore focused on establishing the condition of the concrete and steel joists within the balcony slab, concentrating primarily on the spalled areas to the North West corner of the hall.

Where exposed the joists generally revealed minimal corrosion with corrosion product of 10-15mm being evident. This represents a loss of section of 1-1.5mm which is not deemed to be structurally significant. However there are some joists within the defective area of balcony soffit which exhibit severe corrosion of the lower flange where necking and thinning of the steel are evident. Previous repairs were identified to one of the joists in this area, primer was found to have been applied to the steel although corrosion of the joist was still noted. The repair mortar was found to be saturated and water staining was evident to the soffit. This suggests water ingress has been an ongoing issue and that the previous repairs have dealt with the symptom and not the cause of the deterioration observed.

Damp meter readings to the balcony soffit and behind the wooden cladding to the West wall of the North hall revealed high levels of moisture within the fabric of the structure. This is indicative water ingress through the wall and from the wall into the clinker concrete slab of the balcony and along the steel joist. Oxygen within the voids of the clinker concrete and the presence of the water has facilitated the corrosion of the steel evident.

Due to the significant corrosion observed to some of the joists to the North West corner of the balcony we sought to confirm that there has been no significant loss of strength to the structure of the balcony. To achieve this Martech undertook a level survey of the balcony soffits. This was undertaken to the Western most balcony slab in both the North and South Hall. The survey would be expected to indicate deflection of the cantilevered filler joist balcony should there have been a loss of strength within the filler joist slab. Whilst it should be noted that the general presence and de-bonding of the plaster and render finishes may have had an effect on the survey no significant deflection was identified further supporting the view that the structural integrity of the balcony has not been compromised at this time.

In order that the area of cracked and spalled soffit could be safely re-opened to the public Martech removed any remaining loose material and disc cut the concrete back to a sound edge. Temporary holding repairs to the soffit were then undertaken and involved, cleaning and priming the steel and repairing the concrete with a proprietary concrete repair material. It must be stressed that these repairs are temporary and are intended only to allow sufficient time for a permanent repair strategy to be implemented.

3.2.4 North West External Wall

As outlined in 3.2.3 above there is clear evidence of water ingress through the wall which is contributing to the corrosion of the steel joists within the balcony slab. The external surface of the wall had until the commencement of these works been covered by Virginia creeper and as such any deterioration / defects were not wholly apparent. The inspection of the wall revealed an area of leakage and staining around a rainwater downpipe which was wet to touch, in addition probing with the damp meter revealed the whole surface of the wall to be saturated. The high moisture levels within the fabric of the wall appear to be attributable to three main factors; faulty rainwater goods resulting in excessive water flow over the surface of the wall which is exacerbated by the high level of run off from the barrel roof during heavy / prolonged periods of rainfall, the presence of the Virginia Creeper restricting air flow across the surface of the wall and therefore preventing it from drying out and deterioration of the mortar joints and brickwork, which itself is likely to be exacerbated by the excessive water flow over the surface of the wall.

Opening up works to expose the outer end of the filler joists embedded in the wall revealed the corrosion to be no worse than anywhere else within the structure with a slight loss of section (5-10mm corrosion product evident) noted although this is not deemed to have had an affect on the structural integrity of the joists. In addition to the joists an unusual steel plate and hanger arrangement was noted within the wall, the exact purpose of this is unclear at present although the steel was found to be in the same condition as the filler joists and may become a significant durability issue if the water ingress is not addressed.

3.2.5 South Hall Balcony

As with the testing and investigation works within the North hall the South hall balcony underwent opening up, testing and a level survey. The opening up revealed the steel joists to exhibit some corrosion as in the rest of the structure. The concrete around the joists as is usual for clinker concrete and as noted elsewhere in the museum was carbonated beyond the depth of the steel joists thus facilitating the corrosion of the steel. However, these areas were found to be dry and therefore the corrosion process has not been as active as in other areas such as the North hall balcony. As a result there do not appear to be any significant structural issues within the South hall balcony structure based upon the results of the current investigations.

3.2.6 Clock Tower - Internal

Cracking and spalling of the stonework around the clock face fixings was evident on the North, South and West faces. The North and West faces of the clock exhibited significant levels of condensation and damp/mould to the surrounding stonework.

The North face appeared the worst with spalling of the stone around two of the four fixing points. As this was the worst case two areas of stonework were opened up around the fixings with a further area of spalling being removed to the bottom fixing on the South face of the tower. The investigations in these areas revealed the fixings to comprise a 50x120x12mm flat metal peg with fishtail end sat into a grout filled pocket cut into the stone the peg is attached to the outer ring of the clock face by an 18mm diameter threaded stud and square nut. The opening up also revealed corrosion of the fixings with loss of section of approximately 4mm in most cases and visible corrosion product of 10-15mm

The East face exhibited no visible spalling or cracking of the stonework around the fixings although slight corrosion was evident to the exposed sections of the fixings between the stone and the clock face.

All four faces of the clock exhibited gaps or repairs to the glazing, cracked/missing putty joints and poor sealing of the gaps between the clock face outer ring and the stonework.

Testing to the concrete soffit in the clock room revealed low cover to the steel joists and low levels of chlorides but high levels of sulphates (above an acceptable level of say 4% by mass of cement). This is common in clinker type concrete due to the nature of the aggregate within it.
The walls within the clock room show signs of moisture ingress and condensation in a number of places, such as beneath the clock faces, the corners of the clock tower walls and along the timber supports of the clock mechanism. In addition staining suggesting water ingress was noted to the soffit of the room and vertical cracks were evident to the brickwork walls of the tower. However we were informed that these were historical and had not worsened in recent years.
The roof of the clock tower showed signs of both leakage, and condensation to the lower flanges of the filler joists which has resulted in noticeable corrosion of the steel joists.

3.2.7 Damp Meter Survey

The damp meter survey revealed a number of areas to the walls and soffits within the museum to have sufficiently high moisture content to be classified as wet or at risk. This primarily affected the following areas, North and East external walls of Office D (main office), Internal wall and joist mid span within the natural history work room and laboratory, both internal and external walls within office G and J, the external wall of office K, internal and external walls and joist mid span in office H, and the North West corner of the North Hall balcony soffit and adjacent wall.
These results indicate condensation and or water ingress within the above areas. However, it is felt that whilst there may be some water ingress through the East wall of the offices the re-roofing of the flat roofs appears to have addressed water ingress issues and the moisture detected is residual moisture which has remained within the fabric of the structure.
The primary area of concern however is the water ingress through the Western wall of the North Hall which is detailed in 3.2.4 above.

3.2.8 Visual Inspection of the North and South Barrel Roofs

The roofs were found to be in generally good condition. Both roofs were found to have lead covering to the top half and zinc sheeting to the lower half. The South roof exhibited evidence of previous repairs and there were some holes and gaps in the roof which may account for peeling of the paint coatings internally. No significant defects were identified to the North hall roof however the faulty gutter above the area of water ingress to the North Hall wall was found to be unlined and blocked by debris and remains of the Virginia creeper.

4 DISCUSSION AND RECOMMENDATIONS

4.1 Following completion of the works by Martech and ourselves the testing and investigation results suggest that the building appears to be performing well for a structure of this type and age. The results also indicate that there are no significant structural issues within the areas investigated. There are however a number of durability issues which if not addressed may become critical and ultimately lead to structural deterioration of the building fabric.
The following comments and recommendations represent what we feel to be the best way forward in addressing the issues highlighted by the investigation and testing works. We expect that any future works will be implemented on a rolling programme of works as part of the Museums 10yr maintenance strategy and this has, as far as is possible at this stage, been taken into account in making these recommendations.
In addition these discussions and recommendations are outlined in priority order and as a series of potential repair packages in the remedial repairs summary section of this report (5.0).

4.1.1 West and East External Walls

The water ingress through the West wall of the North hall is facilitating the corrosion of the steel joists identified within the North hall balcony soffit. The water ingress is attributable to a combination of factors and therefore a number of remedial recommendations have been made to prevent further deterioration of the structural fabric of the filler joist balcony and the wall itself. Firstly it is essential to ensure that the rainwater goods are well maintained in order to ensure the overtopping and leakage from the joints in the gutter troughs and leakage from damaged/deteriorated down pipes observed during the investigations are not contributing to excessive water flow over the surface of the wall. It is therefore recommended that all rainwater goods are inspected and repaired as required.

Prior to the investigations to the exterior of the wall it was covered by Virginia creeper this further has exacerbated the problems caused by the faulty/blocked rainwater goods by restricting the airflow across the surface of the wall and preventing it from drying out. It is recommended that the Virginia creeper is not replanted to enable the wall to dry out affectively; alternatively the creeper could be replanted but with a proprietary wire trellis fixed to the wall so that the creeper is supported off the face of the wall and thus enabling airflow across the surface of the bricks behind the creeper.

Due to the factors outlined above the surface of the wall has undergone accelerated weathering/deterioration. In order to ensure any durability issue arising from this are identified and addressed it is therefore recommended that the wall is inspected by a specialist brickwork contractor and any areas of brick/crack repair and mortar re-pointing are undertaken as soon as is practicable. This should be undertaken following any necessary repair works to the rainwater goods and prior to the reinstatement of the Virginia creeper and associated trellis if required.

Implementation of the above recommendations is likely substantially reduce the water ingress and facilitate drying out of the building fabric this is essential in order to significantly arrest the corrosion of the steel joists and fixings within the wall and adjacent balcony slab. In order to further protect the structure consideration should be given to the application of a water repellent treatment over the surface of the wall which is designed to prevent the ingress of moisture into the brickwork but enable water vapour to escape. Whilst this is would not be an essential remedial repair it is felt that this would offer additional protection from the elements and in the event of future leakage from the rainwater goods.

The East external wall of the museum did not exhibit the same degree of water ingress as the West wall. However, evidence of cracking within the brickwork due to joist corrosion, the steel corrosion observed at breakout locations and the damp meter readings taken it is recommended that all rainwater goods, brickwork and mortar pointing are inspected and repaired as required. As with the West wall the application of a water repellent brickwork treatment should also be considered.

4.1.2 Covered Filler Joist Soffits

The filler joist soffits above the false ceilings exhibited cracking and spalling of the render and plaster primarily along the lines of the steel joists. Corrosion of the steel joists was also evident as was corrosion of the steel beam supporting the mono pitched roof to the East side of the rooms. It is recommended that further safety works are undertaken within these areas to remove any immediately loose and dangerous material as this currently poses a health and safety risk. As the condition of these areas was previously unknown and due to the time constraints of the current programme of works these additional safety works could not be undertaken whilst Martech were on site. It is envisaged that due to the fact that these areas have false ceilings and the logistical issues of stripping away these ceilings and any services (pipes or cabling) above that netting would not be installed within these rooms it would therefore be recommended that these soffits are inspected and hammer tested at regular intervals in order to identify and address any immediately loose or dangerous areas of plaster or render which may become de-bonded in the

future. At the same time visual inspections of exposed steel joists should also be undertaken so as to identify any further deterioration of the steel as it occurs allowing action to be taken as required.

4.1.3 North Hall Balcony Soffits

In order to significantly arrest the corrosion of the steel joists observed to the North West corner of the balcony soffit is essential to stop the ingress of water through the external wall. Recommendations for achieving this are detailed in 4.1.1.

Once the water ingress issues have been addressed it is imperative that the soffit is allowed to dry out before any further repairs are undertaken. Due to the high level moisture detected within the slab it is suggested that consideration be given to the stripping of surface finishes in these areas in order to accelerate the drying out process.

Initial visual inspections and previous hammer testing undertaken by Conisbee to the East and West balcony soffits within the North hall indicated significant areas of hollow / de-bonded render. For this reason Martech were asked to undertake additional hammer testing of the entire soffit of these two balconies. The hammer tapping and visual inspection confirmed there to be areas of significantly de-bonded render and plaster. Due to the fact that these areas are open to the public they are deemed to represent an immediate health and safety risk. The netting of the soffits as was undertaken in the office spaces is not felt to be suitable for these soffits as the level of disruption and logistical and financial this would cause would be as great as that required to permanently repair the soffits. We would therefore recommend that these areas are repaired as soon as is practicable.

It is further recommended that these areas be vigilantly monitored by the museum maintenance staff to identify any worsening of the fine cracking / bulging of the plaster until affective repairs can be undertaken.

4.1.4 Clock Tower

The spalling and cracking observed to the stonework around the clock face fixings needs to be addressed in order to prevent further deterioration and potentially complete detachment of the clock faces themselves. The deterioration observed is due to the corrosion of the clock face fixings; this is described in section 3.2.6 of this report. The key issues contributing to the corrosion of the fixings which has resulted in the spalling and cracking of the stonework are ingress of water around the outer ring/glass panes of the clock face and condensation within the clock tower. It is felt that the clock faces should be removed in order for the repairs to the stonework to be undertaken. This could be achieved either by cutting out the defective stonework and replacing it with new stone from a source to match the original material or the damaged stone could be repaired using a specialist proprietary repair mortar. The later of these methods is likely to offer a financial saving however the repairs should be planned in conjunction with a specialist stonework repair contractor and the local government conservation officer in order to identify the most appropriate methodology for the structure given its listed building status.

Whilst the clock face is removed to facilitate the stonework repairs it would seem to be an opportune time to refurbish the metal frame and glass panes, the damaged fixings should also be refurbished or replaced at this time and when the clock face is reinstated the gap between the stonework and the metal frame should be sealed to further prevent water ingress. It should be noted that any sealant used should be neutral curing so as to avoid bleeding into/staining of the stonework.

It is understood that the museum may wish to alter the fixing arrangement of the clock face in order to prevent similar deterioration of the structure in the future we would be happy to provide advice on such issues as they arise.

It is further recommended that consideration be given to the installation of either passive cross ventilation, mechanical ventilation or a dehumidifier in order to reduce the high level of

condensation within the tower. Of the three options a dehumidifier may be the most favourable option as rainwater drain pipes already run down the inside of the tower meaning the installation of new pipes to remove the condensed water would not be required. The equipment may need to be constructed in situ due to the restricted access to the tower however we would recommend advice be sought from a specialist with regards to the installation of such equipment. It should be noted that the implications of any additional loads on the floor slabs from the equipment would need to be established prior to installation.

Should the stonework repairs and clock face refurbishment not be undertaken for a significant period of time (6-12 months) it is recommended that intermediate holding repairs are undertaken. These repairs would include temporary additional fixings as required to secure the clock face in the short term whilst the permanent repairs/alterations are scheduled. In addition the gap between the clock face, fixings and the stonework should be sealed to prevent water ingress and further deterioration of the fixings and stonework. Once again should be noted that any sealant used should be neutral curing so as to avoid bleeding into/staining of the stonework.

4.1.5 Filler Joist Slab Soffit Repairs

The office and laboratory spaces have been made safe by the undertaking of the safety works and the installation of the debris netting. Furthermore recommendations for additional safety works to the filler joist soffits above the areas of false ceilings have also been made to ensure the safety of the personnel accessing and working within these areas. It must be noted that these measures are of a temporary nature in order to allow works to be scheduled and undertaken as part of a rolling programme of works over the next 10 years. However, these measures themselves will require regular inspection and possibly maintenance if the issues are not addressed within the next 2-3 years.

The remedial works required to permanently restore the slabs will involve traditional filler joist concrete repairs and reinstatement of the render and plaster finishes. The repairs comprise the following stages and should be undertaken by a suitably experienced and reputable specialist contractor. These repairs are similar to those holding repairs undertaken by Martech to the North Hall balcony soffit but are more extensive/involved and would involve a specific sequence of works.

Stages of traditional filler joist repair

- Removal of loose and de-bonded surface finishes.
- Cutting out of concrete along the length of filler joist, done in sections to avoid compromising the structural integrity of the slab.
- Cleaning and priming of the steel joists and any other metal work cast within the slab.
- Stainless steel mesh placed over the bottom flange of the filler joist and securely screwed to the concrete either side of the joist.
- Bonding slurry applied to the prepared concrete and steelwork and the repair mortar placed (not rendered) and left flush with existing concrete to allow for application of plaster finishes.

This repair method applies to any areas of filler joist repair regardless of the position within the structure. Details for a typical filler joist repair are given in Appendix D of this report.

4.1.6 Boiler Rooms

The boiler rooms should continue to be designated hard hat areas as there is a risk of de-bonded plaster or render falling from the soffit. In addition due to the warm and dry environment within these rooms limiting the potential for extensive corrosion of the steel joists and the limited nature of use of the rooms it is not considered that the rooms require any immediate remedial works. It is

however suggested that the loose areas of render and plaster are monitored to identify any significant change in condition, possibly with a visual inspection to be included as part of the regular inspections by an engineer/specialist contractor within other areas of the structure. In addition consideration should be given to the necessity to provide fire protection to the steel joists as this has been lost in a number of areas due to the spalling/removal of render, plaster and concrete from the soffit.

5.0 SUMMARY OF REMEDIAL REPAIRS AND REPAIR PACKAGES

On the whole the structure appears to be performing well considering the age and form of construction of the buildings. Whilst no significant structural issues were identified during the works e.g. loss of support and/or stability of structural elements there are a number of durability issues which if not addressed may become critical such as deterioration of the outer layers of structural elements. These durability issues are outlined within our report but primarily revolve around the water tightness of the structure and the repairing/making safe of defective elements of the building fabric.
Our recommendations and remedial repairs are summarised below and have been allocated a level of priority to reflect the urgency of the works (1 high priority, 3 low priority). This summary should also be read in conjunction with the plans highlighting the priority areas and suggested repair packages. There are five repair packages which were created dependant on the area of the structure they are in and the priority of the repairs required.

5.1 Water proofing and repair and maintenance of the external East and West walls of the structure – This will involve the repair and continued maintenance of rainwater goods, ensuring the walls are vegetation free (if any plants are allowed to grow over the walls this should be up purpose made wire trellising so that airflow across the surface of the wall is maintained, assessment and repair as required of the brickwork and mortar to the walls, consideration should also be given to the application of a water repellent treatment over the brickwork which will prevent water ingress but allow water vapour to escape (allowing the building fabric to breath).
Priority Level 1

5.2 Repair of the North Hall balcony soffits – During the works extensive areas of hollow and de-bonded render / plaster were identified to the balcony soffits within the North Hall. It is recommended that these areas be repaired as soon as is practicable as the hollow and de-bonded render poses a health and safety risk to the users of the North Hall. It is not felt to be an option to undertake safety works and installation of netting as with the North Hall offices as it is likely to involve the same extensive protection of the exhibits and disruption to the use of the space as if permanent repairs were undertaken. It is also likely that some areas of temporary repair would also be required and there would be the added visual impact of the netting, missing render and temporary repairs within a public area of the museum.
The permanent repairs are similar to those holding repairs undertaken by Martech to the North Hall balcony soffit but are more extensive and would involve a specific sequence of works including reinstatement of plaster and render
Priority Level 1

5.3 Repair to the filler joist soffits above false ceilings (tower offices and security offices) – This represents an immediate health and safety risk and it is recommended that the soffits are hammer tested and any immediately loose and dangerous material removed and debris safety netting installed. However, due to the restricted access and high level of disruption which would be caused by undertaking such works in these areas it is felt that it would be easier logistically and more cost effective to undertake permanent repairs rather than have all the disruption and cost twice (initially for the safety works and again for the permanent repairs).
Priority Level 1

5.4 North and South Hall offices filler joist soffit repairs – The office and laboratory spaces have been made safe by the undertaking of the safety works and the installation of the debris netting. It must be noted that these measures are of a temporary nature in order to allow works to be scheduled and undertaken as part of a rolling programme of works over the next 10 years. However, the safety measures will themselves require regular inspection and possibly maintenance if the issues are not addressed within the next 2-3 years. The remedial

works required to permanently restore the slabs will involve traditional filler joist concrete repairs and reinstatement of the render and plaster finishes.

Priority Level 2

5.5 Repairs to the clock face and stonework of the tower – The spalled stonework and corroded clock face fixings require repair in order to prevent further deterioration of the structure and the potential detachment of the clock face itself. However, it is appreciated that the repairs to the clock tower are likely to require further discussion between the museum and us to agree a sympathetic and cost effective solution the discussions will also necessarily involve conservation/heritage officers from the local council. This may take some time to agree a way forward and funding and so it is recommended that the following action is taken whilst the permanent repair strategy is agreed. Sealing of the gaps around the clock face and fixings should be undertaken to prevent water ingress both from the elements and condensation. Consideration should also be given to the addition of passive cross ventilation, mechanical ventilation or dehumidification within the tower in order to reduce the excessive levels of condensation observed within the tower which are contributing to the corrosion observed to the clock face and fixings.

Note. Temporary holding repairs must be reversible and when sealing around the clock face and fixings a neutral curing sealant should be used to prevent the possibility of staining of the stone.

Priority Level 2

5.6 Boiler room filler joist soffits - The boiler rooms should continue to be designated hard hat areas as there is a risk of de-bonded plaster or render falling from the soffit. In addition due to the warm and dry environment within these rooms limiting the potential for extensive corrosion of the steel joists and the limited nature of use of the rooms it is not considered that the rooms require any immediate remedial works. It is however recommended that the loose areas of render and plaster are monitored to identify any significant change in condition, with a visual inspection to be undertaken by a structural engineer every 12 months. In addition consideration should be given to the necessity to provide fire protection to the steel joists as this has been lost in a number of areas due to the spalling/removal of render, plaster and concrete from the soffit.

Priority Level 3

6.0 COST OF FUTURE REMEDIAL REPAIRS

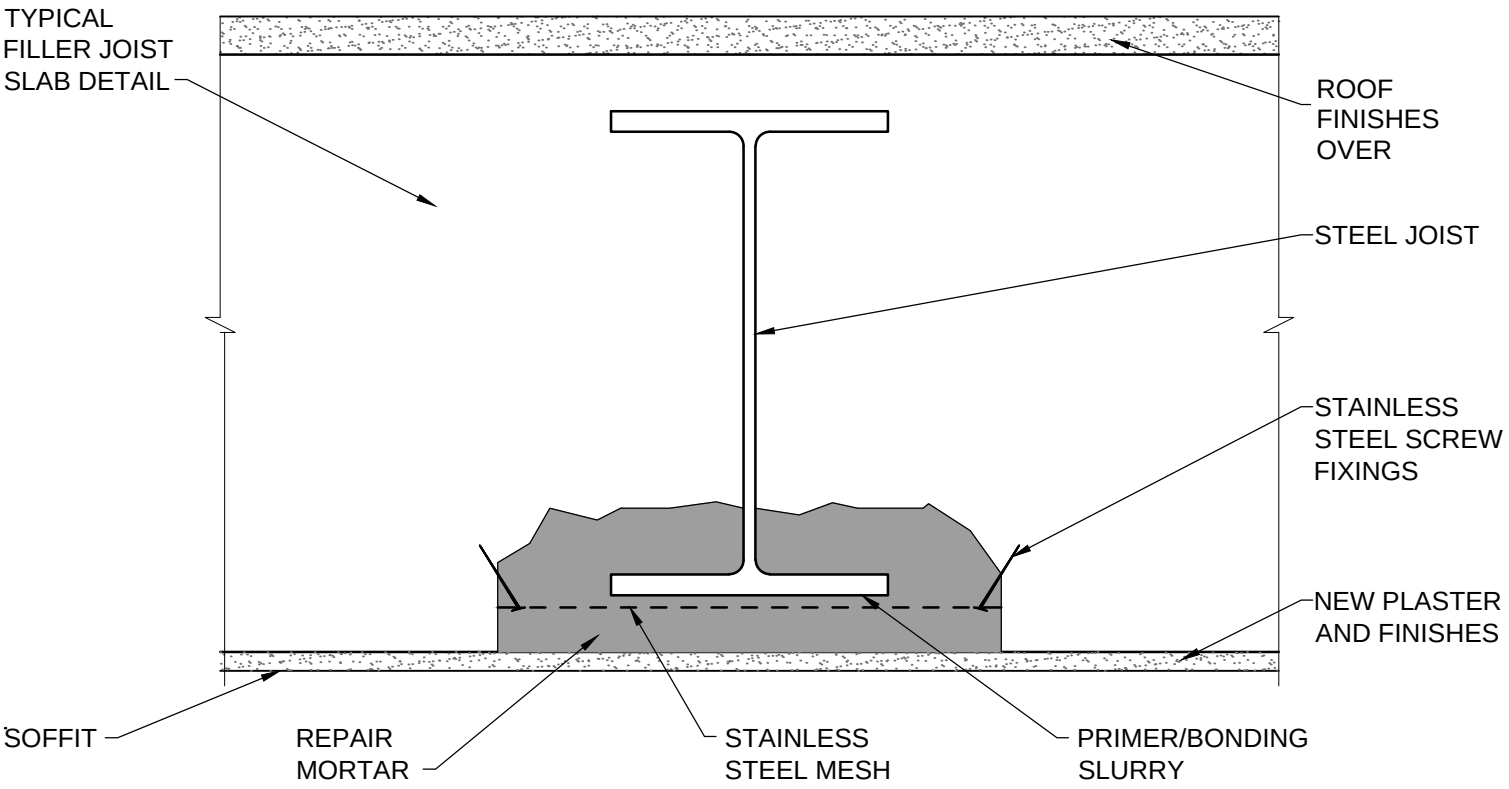
We appreciate that the Museum management and trustees are likely to require an indication as to the value of the remedial repairs outlined within this report. This is not something that Conisbee are able to provide directly. However, we would be happy to discuss our findings with a suitably qualified and reputable contractor with a proven track record in dealing with similar types of structures and repairs in order to compile an approximate cost for the different aspects of repair to help with the budgeting of the works as part of the museums maintenance strategy. In the event of such an arrangement and based on our previous experience it is envisaged that any such contractor brought in on this basis would be happy to provide budget costs with the provision that they would be afforded an opportunity to tender for the works as they arise.

APPENDIX C – SPECIFICATIONS AND DRAWINGS

• FILLER JOIST REPAIR DETAIL
(Ref: SSK001)

• PLAN OF INCLUDED AREAS
(REF: S101)

• DESIGNERS RISK ASSESSMENT
(160169/S Prior)



TYPICAL SECTION

DIAGRAMMATIC

SEQUENCE OF WORKS

1. PREPARE SURFACES AND UNDERTAKE HAMMER TAP SURVEY TO SLAB SOFFIT - MARK AREAS OF LOOSE OR DEBONDED CONCRETE ON SOFFIT.
2. PRIOR TO BREAKING OUT DEFECTIVE RENDER AND CONCRETE, DELINEATE LOOSE/DEBONDED AREAS WITH A DISC CUTTER.
3. REMOVE LOOSE/DEBONDED/DEFECTIVE CONCRETE AND RENDER.
4. PREPARE EXPOSED FILLER JOIST AND OTHER EMBEDDED METAL WORK AND PAINT WITH PRIMER.
5. OFFER UP AND FIX STAINLESS STEEL MESH TO BOTH SIDES OF JOIST.
6. APPLY BONDING SLURRY AND WET ON WET APPLY REPAIR MORTAR LEVEL WITH SOFFIT. PROTECT AND CURE.
7. APPLY RENDER/SCRAPE COAT AS REQUIRED.
8. APPLY NEW PLASTER AND DECORATIVE FINISHES.

This drawing must be read in conjunction with the specification and all other relevant drawings. Do not scale from this drawing.

FOR CONSTRUCTION

Rev	Date	Description	Drawn	Check
C1	10.06.2016	CONSTRUCTION	SP	TG

conisbee
Consulting Structural Engineers
Consulting Civil Engineers

1-5 Offord St
London N1 1DH
Tel 020 7700 6666
Fax 020 7700 6686
design@conisbee.co.uk
www.conisbee.co.uk

Project
HORNIMAN MUSEUM
REPAIR CONTRACT Ph3

Title
FILLER JOIST REPAIR
DETAIL

Drawing Status
CONSTRUCTION

Project No
160169

Date
2015

Drawn
SP

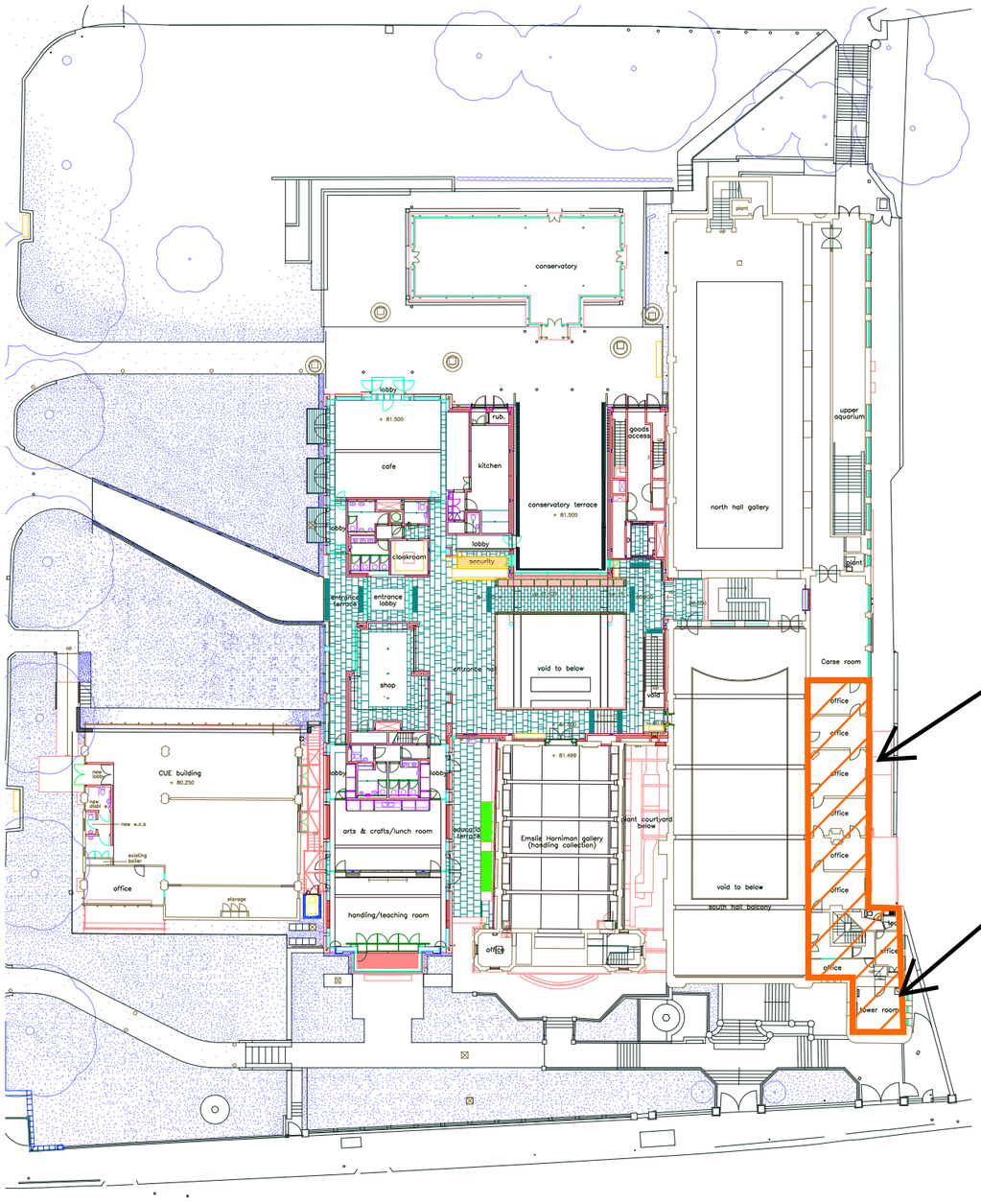
Drawing No
SSK001

Scale
NTS

Engineer
SP

Revision
C1

This drawing must be read in conjunction with the specification and all other relevant drawings. Do not scale from this drawing.



South Hall Offices

Clock Tower Office

LEVEL 2 PLAN - SOUTH HALL OFFICE WORK AREA

KEY

WORKS AREA

NOT FOR CONSTRUCTION

Rev	Date	Description	Drawn	Check
A3	16.06.16	TENDER	SP	SP

conisbee
Consulting Structural Engineers
Consulting Civil Engineers

1-5 Offord St
London N1 1DH
Tel 020 7700 6666
Fax 020 7700 6686
design@conisbee.co.uk
www.conisbee.co.uk

Project
HORNIMAN MUSEUM
REPAIR CONTRACT Ph3

Title
PLANS INDICATING WORK AREAS

Drawing Status		Project No
TENDER		**160169**
Date	Drawn	Drawing No
JUNE 2016	SP	**S100**
Scale	Engineer	Revision
NTS	SP	**T1**

conisbee | Consulting Structural Engineers
Consulting Civil Engineers

CONSTRUCTION HAZARD ASSESSMENT
STRUCTURAL DESIGN for

Horniman Museum Repair Contract Ph3

London
1 – 5 Offord St London N1 1DH
Telephone 020 7700 6666

Norwich
2 Woolgate Court
St Benedicts Street
Norwich NR2 4AP
Telephone 01603 628 074

Cambridge
47 – 51 Norfolk Street
Cambridge CB1 2LD
Telephone 01223 656 058

design@conisbee.co.uk
www.conisbee.co.uk

It is assumed that the project is to be undertaken by experienced and competent designers and contractors who are aware of the common risks associated with construction processes.

The summary below is intended to help all parties recognise the less common hazards which may be encountered in this particular project through an understanding of the structural principles involved and the assumptions made by the design engineer.

We do not claim to have identified all hazards

Ref: 160169/S Prior
Date: 11 Aug 2016
Version: 1

Project Title: Horniman Museum Repair Contract Ph3		Project No: 160169
Consideration	**Yes/No**	**Comment**
1.0 NEW SUBSTRUCTURE AND FOUNDATIONS	N/A	
1.1 **Utilities**		
1.1.1 Has a public utilities search been implemented?		
1.1.2 If not why not?		
1.1.3 Which utilities may affect the project?		
1.2 Site Investigations		
1.2.1 Has a desk study been undertaken?		
1.2.2 Has a soil investigation been undertaken?		
1.2.3 If not why not?		
1.2.4 Does the investigation highlight any:		
○ Exceptional strata		
○ Water problems		
○ Contamination		
○ Obstructions		
○ Other issues?		
1.3 Site Strip		

Project Title: Horniman Museum Repair Contract Ph3		Project No: 160169
Consideration	**Yes/No**	**Comment**
1.3.1 What is the anticipated depth of site strip?		
1.3.2 Are any special precautions needed when excavating and removing material?		
1.4 **Foundations**		
1.4.1 Describe the proposed foundations in outline.		
1.4.2 Do any excavations that require hand finishing exceed 1.2 m depth?		
1.4.3 Are any excavations envisaged close to adjoining structures?		
1.4.4 If yes, have their foundations been examined and recorded?		
1.4.5 Are any special shoring procedures needed?		
1.4.6 Have any existing underground services or obstructions been identified?		
1.4.7 Are any excavations close to existing services?		
2.0 SUPERSTRUCTURE – NEW BUILD AND EXTENSIONS	N/A	
2.1 **General**		
2.1.1 What structural system is proposed?		
2.1.2 How is stability to be achieved?		

Project Title: Horniman Museum Repair Contract Ph3		Project No: 160169
Consideration	**Yes/No**	**Comment**
2.1.3 If a frame is being used will any special sequence of craneage be needed?		
2.1.4 Will any temporary works be necessary to ensure stability during erection?		
2.2 **Walling and Cladding**		
2.2.1 What construction is envisaged for the external envelope of the building?		
2.2.2 What construction is envisaged for internal partitions?		
2.2.3 Does walling or cladding provide either temporary or long-term stability to the building?		
2.2.4 Can all units be safely lifted and placed in position by one person?		
2.2.5 Are walls stable in the temporary condition before floors/roofs applied?		
2.3 **Beams and Lintels**		
2.3.1 What beams and lintels are envisaged in the works?		
2.3.2 Are special (in terms of size, weight, awkward shape or requiring assembly work on site) beams and lintels necessary?		
2.3.3 Are there any special handling and erection sequences which need to be followed?		
Are beam weights, moments and reactions indicated on the drawing?		

Project Title: Horniman Museum Repair Contract Ph3		Project No: 160169
Consideration	**Yes/No**	**Comment**
2.4 **Floors and Stairs**		
2.4.1 Outline the proposed construction of floors and stairs.		
2.4.2 Define the imposed load capacity required		
2.4.3 Has any special allowance for construction loads been allowed?		
2.4.4 Is the design by others?		
2.4.5 Is craneage necessary?		
2.5 **Roof**		
2.5.1 Describe the proposed roof construction.		
2.5.2 Define the imposed load capacity required.		
2.5.3 Is design by others?		
2.5.4 Is craneage necessary?		
2.5.5 Is the erection sequence important for stability during construction?		
3.0 INFRASTRUCTURE AND EXTERNAL WORKS	N/A	
3.1 Describe the Highway works and any issues related to their construction that are unusual or represent significant hazards.		

Project Title: Horniman Museum Repair Contract Ph3			Project No: 160169
Consideration		**Yes/No**	**Comment**
3.2	Describe the drainage works and any issues related to their construction that are unusual or represent significant hazards		
3.3	Are any excavations close to existing services, or sensitive uses?		
3.4	Describe any external works, retaining walls, earthworks etc.		
3.5	Is design by others?		
3.6	Any special sequence of work or limitation on loading, including temporary loads from construction?		
4.0	**SUPERSTRUCTURE REFURBISHMENT, REPAIRS AND STRUCTURAL ALTERATIONS**	YES	
4.1	What is the construction and load bearing elements of the existing building?		Within the South Hall offices the structure comprises solid masonry load bearing walls with filler joist floor slabs. The foundations of the structure are unknown.
4.2	What provides stability at present?		See 4.1 above

Project Title: Horniman Museum Repair Contract Ph3			Project No: 160169
Consideration		**Yes/No**	**Comment**
4.3	What is the nature of the proposed works?		Repair of the filler joist slab soffits See Conisbee Filler joist Repair Detail
4.4	What will provide stability in future?		The existing structure. See 4.1 above.
4.5	Have any major structural defects been discovered?	No	However, durability issues have been identified to the soffits of the filler joist slabs e.g. delaminated and loose plaster and clinker concrete beneath the steel joists.
4.6	Are any special precautions or procedures necessary before the works begin in earnest?	Yes	When the defective concrete is being removed from beneath the filler joists care must be taken to avoid removing the concrete bearing onto the lower flange of the steel joist as this may cause a partial collapse of local areas of concrete.
4.7	Are any unusual risks anticipated in the execution of the works?	Yes	See 4.6 above
4.8	Are there any special sequences of alteration, repair or erection which need to be followed?	Yes	See 4.6 above. Sequential hit and miss repair may be required. Should any steel filler joists or sections of clinker concrete be found to be in significantly worse condition than anticipated the contractor is to cease work in this area and contact the structural Engineer. The contractor is responsible for

Project Title: Horniman Museum Repair Contract Ph3			Project No: 160169
Consideration		**Yes/No**	**Comment**
			ensuring the stability of the structure at all times during the works.
4.9	Define imposed load capacities to be achieved.		5.0kN/m^2
4.10	Are any walls, floors or their coverings being removed in the works which might lead to temporary loss of stability in the building?	No	
5.0	**BUILDING IN USE**		
5.1	Are any elements of the structure expected to fatigue or wear or require ongoing maintenance and repair work during the design life of the building?	No	
5.2	Are there any elements in the civil engineering works (e.g., pumps, catch pits, silt traps, permeable paving) that require maintenance during the design life of the building?	No	
5.3	Are regular ongoing inspections required – define frequency.	Yes	Annual visual inspections of the floor and soffits

Project Title: Horniman Museum Repair Contract Ph3		Project No: 160169
Consideration	**Yes/No**	**Comment**
6.0 DEMOLITION AT THE END OF DESIGN LIFE	N/A	
6.1 Are any special procedures needed due to method of construction or erection?		

Signature of Project Engineer: Simon Prior Date: 11/08/2016

Signature of Director/checker Date:

APPENDIX D – TENDER FORMS

- CONTRACTORS COMPETENCE /RESOURCES QUESTIONAIRE
- FORM OF TENDER (2 COPIES)
- SECURITY OF DUE PERFORMANCE FORMS

CONTRACTOR COMPETENCE / RESOURCES QUESTIONAIRE

FOR

REMEDIAL REPAIR WORKS

AT

THE HORNIMAN MUSEUM AND GARDENS,
100 LONDON ROAD, FOREST HILL, LONDON, SE23 3PQ

Please provide the information listed below and return with your tender.

If you have a prepared package of relevant information that you can send us please do so. If our questionnaire contains requirements not covered in your package of information it is essential that you add this to the material to be sent to us.

If you have any proposals for dealing with key risk issues please outline them together with any other issues or features that you consider are important for the project and any issues you believe have not been mentioned or identified.

General information

- Name, address and contact telephone number.
- General scope and nature of construction experience.
- H&S management approach (statement, systems, policy), including workforce involvement.
- Records on ill-health and accidents.
- Clear records of action plans and their implementation after any accidents
- Construction Hazard and Risk Management arrangements and procedures, monitoring, audit, and review processes at all stages of construction.
- Management arrangements for co-operation and co-ordination with others (Designers, Principal Designer, other Contractors).
- Experience of construction H&S generally.
- Examples of construction hazard and risk management on previous projects, focusing on practical steps and outcomes.
- Construction and general Health and Safety information resources – advisors / consultants and how used.
- Membership of any relevant associations.
- Use of subcontractors and competence checks on them.
- Evidence of active training strategy / programmes to develop / maintain knowledge and practice of Health and safety in construction.
- Evidence of active involvement of the workforce in consultation on H&S matters.
- Details of any initiatives to develop / enhance safety culture on site
- Samples of Risk Assessments and safe methods of working showing how these are co-ordinated with others and how the workforce is involved in developing them.
- Confirmation that appropriate welfare facilities will be put in place before construction work starts and the proposed approach to be adopted and location of any welfare units.

FORM OF TENDER
FOR
ESSENTIAL REPAIRS AND IMPROVEMENT WORKS
AT
THE HORNIMAM MUSEUM, LONDON SE23 3PQ

To: The Horniman Museum and Gardens

I/We having read the Conditions of Contract and Works Schedules delivered to me/us and having examined the location plans included therein do hereby offer to execute and complete in accordance with the Conditions of Contract the whole of the works described for the sum of:

.....
, ...

and within 13 working weeks from the date of possession.
or
Alternatively for the sum of:

.....
, ...
and within ..... weeks from the date of possession.

I/We agree that should obvious errors in pricing or errors in arithmetic be discovered before acceptance of this offer in the priced Works Schedules submitted by me/us these errors will be dealt with in accordance with Alternative 2 contained in JCT Practice Note 6 (Series 2) 'Main Contract Tendering'

This tender remains open for consideration for 180 days from the date fixed for the submission or lodgment of tenders (4).

Dated this: .....day of 2016
Name:
.....
.....
Address:
.....
.....
Signature:
.....
.....

FORM OF TENDER
FOR
ESSENTIAL REPAIRS AND IMPROVEMENT WORKS
AT
THE HORNIMAM MUSEUM, LONDON SE23 3PQ

To: The Horniman Museum and Gardens

I/We having read the Conditions of Contract and Works Schedules delivered to me/us and having examined the location plans included therein do hereby offer to execute and complete in accordance with the Conditions of Contract the whole of the works described for the sum of:

.....
, ...

and within 13 working weeks from the date of possession.
or
Alternatively for the sum of:

.....
, ...
and within ..... weeks from the date of possession.

I/We agree that should obvious errors in pricing or errors in arithmetic be discovered before acceptance of this offer in the priced Works Schedules submitted by me/us these errors will be dealt with in accordance with Alternative 2 contained in JCT Practice Note 6 (Series 2) 'Main Contract Tendering'

This tender remains open for consideration for 180 days from the date fixed for the submission or lodgment of tenders (4).

Dated this: .....day of 2016
Name:
.....
.....
Address:
.....
.....
Signature:
.....
.....

SECURITY FOR DUE PERFORMANCE
FOR
ESSENTIAL REPAIRS AND IMPROVEMENT WORKS
AT
THE HORNIMAM MUSEUM, LONDON SE23 3PQ

To: The Horniman Museum and Gardens

I/We have read the Conditions of Contract and do hereby elect to offer Security of Due Performance as detailed under A, B, C (delete as applicable) for the sum additional to the tender of

, ..., ...
.....

I/We understand this security provision is optional at your discretion.

Signed:
.....
.....

on behalf of:
.....
.....

Date:
.....
.....

A. SECURITY BY BOND To be completed and signed by the Contractor

.....LTD, a Banking/an Insurance/ Guarantee Company (The Company whose registered office is situate at:-

.....
.....

have agreed to be bonded with the Contractor jointly and severally to the Employer and to the extent of 10% of the contract price for the due performance and satisfactory completion of the whole of the works comprised in the contract.

.....Contractors Signature

_____
_____

B. SECURITY BY PAYMENT OF DEPOSIT

.....LTD, (The Contractors) of

.....
.....

hereby declare and undertake that upon this tender being accepted by the Employer the Contractor shall deposit with the Employer a sum equal to 10% of the contract price to be held by the Employer as a forfeitable deposit for the period of the Contract. It shall be a condition of refund that the whole of the works comprised in the Contract shall have been duly completed and defects, if any, duly remedied. The refundable amount will be the deposit plus interest accrued at the minimum lending rate less the amount chargeable to tax at the appropriate rate.

.....Contractors Signature

_____
_____

C. GUARANTEE/INDEMNITY BY PARENT/HOLDING COMPANY

.....LTD., the Contractor, hereby

declare that.....LTD., the Contractors Parent/Holding company have agreed to deliver to the Employer on or before the execution of the Contract in pursuance of this tender a sealed guarantee/undertaking whereupon the determination of the Contractors employment with the Employers for whatever reason or cause the Parent/Holding Company will at the request of the Employer carry on and complete the works described in the contract in accordance with the conditions of the contract and indemnify the Employer for any loss, damage and expense incurred or suffered due to the Contractors default.

To this end the Contractor hereby undertakes to procure the sealed guarantee/undertaking from the Parent/Holding Company.

.....Contractors Signature.....Contractors Seal