FONDAZZJONI GHALL-
PATRIMONJU KULTURALI
TAL-ARĊIDJOĊESI TA' MALTA

REFERENCE NUMBER: **PA.5.0103/27**

Tender for the restoration and conservation of the main façade and the side façade on the south side on the Sacristy of the Church of the Assumption in Qrendi

Date Published:	**14th May 2021**	
Deadline for Submission:	**18th June 2021**	**at 09:30am CEST**
Tender Opening:	**22nd June 2021**	**At 10:00am CEST**

Operational Programme I – European Structural and Investment Funds 2014-2020 –
"Fostering a competitive and sustainable economy to meet our challenges"
Project part-financed by the European Regional Development Fund
Co-financing rate: 80% European Union; 20% National Funds

Bid Bond requirements for this tender: *Not Applicable*

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SECTION 1 – INSTRUCTIONS TO TENDERERS

1. General Instructions

1.1 In submitting a tender, the tenderer accepts in full and in its entirety, the content of this tender document, including subsequent Clarifications issued by the Non Governmental Organisation (NGO), whatever the economic operator's own corresponding conditions may be, which through the submission of the tender is waived. Tenderers are expected to examine carefully and comply with all instructions, forms, contract provisions and specifications contained in this tender document. These Instructions to Tenderers complement the General Rules Governing Tenders for NGOs Version 1.0.

No account can be taken of any reservation in the tender in respect of the procurement documents; any disagreement, contradiction, alteration or deviation shall lead to the tender offer not being considered any further.

Prospective tenderers must submit their offer by depositing it in the tender box, located at Fondazzjoni ghall-Patrimonju Kulturali ta' l-Arcidiocesi ta' Malta, Archbishop's Curia, St Calcedonius Square, Floriana FRN 1535 MALTA. Any references in the tender document or tender forms to uploading of tender documentation and forms is to be ignored. **Tenderers must submit one original tender offer as well as a soft copy on a USB (soft copies of the tender offers submitted on CD are strictly not acceptable). Furthermore in the soft copy of the tender offer, Tenderers must submit the Bill of Quantities duly filled in, in excel format apart from a scanned copy of the filled in Bill of Quantities. It is important that the full tender bid package is provided in soft copy given that due to Covid 19 pandemic, utilisation of the soft copy will be highly required throughout the evaluation process. Tender reference number and tender title must be clearly indicated on the sealed bid. Prospective tenderers take full responsible to submit their offer by the set tender submission deadline.**

Note:
Where in this tender document a standard is quoted, it is to be understood that the Contracting Authority will accept equivalent standards. However, it will be the responsibility of the respective bidders to prove that the standards they quoted are equivalent to the standards requested by the Contracting Authority.

1.2 The subject of this tender is the restoration and conservation of the main façade and the side façade on south side and side on sacristy of the Church of the Assumption in Qrendi.

1.3 The place of acceptance of the works shall be the Archdiocese of Malta, Pjazza Kalcidonju, Floriana, the time-limits for the execution of the entire contract shall be 40 weeks from the Order to Start Works, and the INCOTERM^{2010} applicable shall be **Delivery Duty Paid (DDP).**

1.4 The Estimated Procurement Value for this Call for Tenders has been based on comprehensive research including appropriate financial analysis. In the context of this procurement, the Estimated Procurement Value, based on market research, is that of €84,000 excluding VAT. This estimate includes the maintenance items listed in the Bill of Quantities.

The purpose of this value shall be the guidance of prospective bidders when submitting their offer and is not to be considered as a binding capping price.

Therefore, the published Estimated Procurement Value is not restrictive and final on the Contracting Authority. Economic Operators are free to submit financial offers above or below the Estimated Procurement Value. However, the Contracting Authority reserves the right to accept or reject Financial Offers exceeding the Estimated Procurement Value

1.5 This is a bill of quantities contract.

1.6 This call for tenders is being issued under an open procedure.

1.7 The beneficiary of this tender is **Fondazzjoni ghall-Patrimonju Kulturali ta' l-Arcidiocesi ta' Malta**.

1.8 This tender is not a reserved contract.

2. Timetable

2.

	DATE	TIME
Clarification Meeting/Site Visit (Refer to Clause 6.1)	N/A	N/A
Deadline for request for any additional information from the NGO **Clarification requests should be addressed to: *NGOs e-mail address*** fond.pkam@gmail.com	4th June 2021	17.00 CEST
Last date on which additional information can be issued by the NGO	11th June 2021	20.00 CEST
Deadline for submission of tenders (unless otherwise modified in terms of Clause 10.1 of the General Rules Governing Tendering for NGOs)	18th June 2021	09.30 CEST
Tender Opening Due to the Covid-19 Pandemic tender opening session will take place 22/06/2021 and general public will not be allowed to attend physically. Tenderers are to leave their email address when submitting the tender and a TEAMS invitation will be sent to the bidders to connect should they wish to witness the tender opening session.	22nd June 2021	10.00 CEST
* All times Central European Time (CET) / Central European Summer Time (CEST) as applicable		

3. Lots

3.1 This tender is not divided into lots, and tenders must be for the whole of quantities indicated. Tenders will not be accepted for incomplete quantities.

4. Variant Solutions

4.1 Variant solutions are not permissible.

5. Financing

5.1 The project is *co-financed* by the European Union, in accordance with the rules of *Operational Programme I – European Structural and Investment Funds 2014-2020* programme

5.2 The Contracting Authority of this tender is **Fondazzjoni ghall-Patrimonju Kulturali ta' l-Arcidiocesi ta' Malta**.

6. Clarification Meeting/Site Visit/Workshop

6.1 No clarification meeting will be held.

Meetings between economic operators and the NGO, other than that provided in this clause during the tendering period are not permitted.

7. Selection and Award Requirements

In order to be considered eligible for the award of the contract, economic operators must provide evidence that they meet or exceed certain minimum criteria described hereunder.

(A) Eligibility Criteria

Economic Operators are to complete the Eligibility Section through the ESPD and the necessary documents as follows: (Note 2)

(i) No Bid Bond is required.

(ii) Declare agreement, conformity and compliance with the General Rules Governing Tenders for NGOs. (Note 2A)

(iii) Declare agreement, conformity and compliance with the provisions of the Statement on Conditions of Employment by completing and submitting the form with title Statement on Conditions of Employment. (Note 2A)

(iv) Power of Attorney (if applicable) (Note 2A)

(v) Data on Joint Venture/Consortium (where applicable) (Note 2A)

(vi) Submission of the declaration form that stipulates that following signature of contract, the successful bidder, will provide evidence in respect of the requirements stipulated regarding Energy Efficiency through the Energy Efficiency Form (if applicable) (Note 2A) Not applicable.

(B) **Exclusion (including Blacklisting) and Selection Criteria – information to be submitted through the completion of the following declaration forms:**

(i) Declaration concerning exclusion grounds (Note 2A)

(ii) Declaration concerning *Selection Criteria* (Note 2A)

(C) Technical Specifications

(i) Tenderer's Technical Offer in response to specifications. (Note 3)

A. Key Experts Form accompanied by CVs of Key experts, copies of qualifications' certifications including warrants, the Statement of Exclusivity and Availability Form, the Self-declaration form for Key Experts (relating to public employees – if applicable) and all other documentation as requested. (Note 2A)

The following Key Experts are required:

a) Key Expert 1: Perit who will assume all the responsibility in terms of the legal obligations as arising under Maltese law (Warrant Nos to be provided) – MQF Level 7 in Design and Conservation;
b) Key Expert 2: **Restoration Technician *(MQF level 4 qualification or equivalent in restoration works of a similar nature)***;
c) Key Expert 3: Licenced Stone Mason;
d) Key Expert 4: **A Warranted Conservator/Restorer – MQF Level 6** (Warrant Nos to be provided);
e) Key Expert 5: Project Manager (MQF level 4 in related area of study) responsible for the works - to oversee and co-ordinate the works with the Supervisor in charge of the project. He or she shall act as a single point contact for the duration of works;
f) Key Expert 6: A **Quantity Surveyor** (MQF level 4 in Construction or Civil Engineering) responsible for the measurement of the works.
g) Key Expert 7: Accredited Health & Safety Officer;

B. Tenderer's Technical Offer which shall consist of: (Note 3)

h) Tender Technical Offer Declaration Form signed by the bidder (Note 3). **(Note: Submission of an unsigned declaration form or a modified declaration form will automatically invalidate the tender bid).**

(ii)

i) A Detailed Method Statement including information on proposed works methodology, products and materials (such as cleaning solutions, preservatives, consolidants, etc.) which is to clearly illustrate how the tenderer expects to achieve the requirements set in the tender specifications and related bill of quantities. (Note 3)

j) A Construction Management Plan A site management plan clearly outlining hoarding and protection, site storage, the use of machinery and equipment, and the human resources that the tenderer envisages to deploy on each one of the two sites for the completion of the works in question. The plan may include drawings or sketches illustrating site dynamics and logistics. (Note 3)

k) A Risk Assessment. A preliminary risk assessment and outline of the health and safety procedures that the tenderer intends to implement for the duration of the works. These documents shall act as a basis for more detailed reports prior to commencement of works by the winning bidder. (Note 3)

l) A Gantt Chart Programme of Works as outlined in the Works Tenderer Technical Questionnaire. The implementation period for this tender is 40 weeks from order to start works. (Note 3)

Literature as per Form marked 'Literature List' to be submitted with the Technical offer at tendering stage.

No changes to the information provided in the Literature submitted will be allowed. Literature submitted shall be rectifiable only in respect of any missing documents. (Note 2B)- Not Applicable for this tender.

(iii) Samples as per section in Form marked 'Sample List' may be requested during the evaluation stage to supplement the technical offer submitted. If requested, the Samples must be submitted within 10 working days of being notified to do so. (Note 3) **Not applicable for this tender.**

(D) Financial Offer

(i) The Tender Form and Tenderer's Declaration are to completed and submitted with the offer; (Note 3)

(ii) A financial offer is to be submitted by filling in the Bill of Quantities, and is to be calculated on the basis of **Delivered Duty Paid (DDP)2020 (Grand Total)** for the works tendered. (Note 3)

Notes to Clause 7:

1. Tenderers will be requested to clarify/rectify, within five (5) working days from notification, the tender guarantee only in the following four circumstances: incorrect validity date, and/or incorrect value, and/or incorrect addressee and incorrect name of the bidder. Rectification in respect of the Tender Guarantee (Bid Bond) is free of charge.

2. A) Tenderers will be requested to either clarify/rectify any incorrect and/or incomplete documentation, and/or submit any missing documents within five (5) working days from notification.
B) Tenderers will be requested to rectify/submit only missing documents within five (5) working days from notification. No changes to the information provided in the Literature submitted will be allowed. Literature submitted shall be rectifiable only in respect of any missing information.
All Rectifications are free of charge.

3. No rectification shall be allowed. Only clarifications on the submitted information may be requested.

Request for Clarification and /or rectifications concerning a previous request dealing with the same shortcoming shall not be entertained.

8. Tender Guarantee (Bid bond)

8.1 No tender guarantee (bid bond) is required.

9. Criteria for Award

9.1 The sole award criterion will be the price. The contract will be awarded to the tenderer submitting the cheapest priced offer satisfying the administrative and technical criteria.

SECTION 2 – EXTRACTS FROM THE PUBLIC PROCUREMENT REGULATIONS

Part **X** of the Public Procurement Regulations

270. Any tenderer or candidate concerned, or any person, having or having had an interest or who has been harmed or risks being harmed by an alleged infringement or by any decision taken including a proposed award in obtaining a contract, a rejection of a tender or a cancellation of a call for tender after the lapse of the publication period, may file an appeal by means of an objection before the Review Board, which shall contain in a very clear manner the reasons for their complaints.

271. The objection shall be filed within ten calendar days following the date on which the NGO has by fax or other electronic means sent its proposed award decision or the rejection of a tender or the cancellation of the call for tenders after the lapse of the publication period.

272. The communication to each tenderer or candidate concerned of the proposed award or of the cancellation of the call for tenders shall be accompanied by a summary of the relevant reasons relating to the rejection of the tender as set out in regulation 242 or the reasons why the call for tenders is being cancelled after the lapse of the publication period, and by a precise statement of the exact standstill period.

273. The objection shall only be valid if accompanied by a deposit equivalent to 0.50 per cent of the estimated value set by the NGO of the whole tender or if the tender is divided into lots according to the estimated value of the tender set by the NGO for each lot submitted by the tenderer, provided that in no case shall the deposit be less than four hundred euro (€400) or more than fifty thousand euro (€50,000) which may be refunded as the Public Contracts Review Board may decide in its decision.

274. The Secretary of the Review Board shall immediately notify the Director and/or the NGO as the case maybe that an objection had been filed with his authority thereby immediately suspending the award procedure.

275. The NGO involved, as the case may be, shall be precluded from concluding the contract during the period of ten calendar days allowed for the submission of appeals. The award process shall be completely suspended if an appeal is eventually submitted.

276. The procedure to be followed in submitting and determining appeals as well as the conditions under which such appeals may be filed shall be the following:

(a) any decision by the General Contracts Committee or the Special Contracts Committee or by the NGO shall be made public by affixing it to the notice-board of the same NGO as the case may be or by uploading it on Government's e-procurement platform prior to the award of the contract if the call for tenders is administered by the NGO;
(b) the appeal of the complainant shall also be affixed to the notice-board of the Review Board and shall be communicated by fax or by other electronic means to all participating tenderers;

(c) the NGO and any interested party may, within ten calendar days from the day on which the appeal is affixed to the notice-board of the NGO and uploaded where applicable on the Government's e-procurement platform, file a written reply to the appeal. These replies shall also be affixed to the notice-board of the Review Board and where applicable it shall also be uploaded on the Government's e-procurement platform;

(d) within three working days of the publication of the replies, the Secretary of the Review Board shall prepare a report (the Analysis Report) analysing the appeal and any reply to it. This report shall be circulated to the persons who file an appeal and to all parties who submitted a reply to the appeal;

(e) after the preparatory process is duly completed, the Director or the Head of the NGO shall forward to the Chairman of the Review Board all documentation pertaining to the call for tenders in question including files, tenders submitted, copies of deposit receipts and any motivated letter;

(f) The secretary of the board shall inform all the participants of the call for tenders, the NGO of the date or dates as the case maybe when the appeal will be heard;

(g) When the oral hearing is concluded, the Public Contracts Review Board, if it does not deliver the decision on the same day, shall reserve decision for the earliest possible date to be fixed for the purpose, but not later than six weeks from the day of the oral hearing:
Provided that for serious and justified reasons expressed in writing by means of an order notified to all the parties, the Public Contracts Review board may postpone the judgment for a later period.

(h) The secretary of the board shall keep a record of the grounds of each adjournment and of everything done in each sitting;

(i) After evaluating all the evidence and after considering all submissions put forward by the parties, the Review Board shall decide whether to accede or reject the appeal.

SECTION 3 – SPECIAL CONDITIONS

These conditions amplify and supplement, if necessary, the General Conditions governing the contract. Unless the Special Conditions provide otherwise, those General Conditions remain fully applicable. The numbering of the Articles of the Special Conditions is not consecutive but follows the numbering of the Articles of the General Conditions. Other Special Conditions should be indicated afterwards.

For the purposes of contracts issued by NGOs, the term 'approval from the Central Government Authority' shall be substituted by the term 'approval by the Head responsible for that NGO'; Furthermore, any references to the Contracting Authority throughout the General Conditions shall be deemed to be referring to the NGO responsible for that procurement.

Article 2: Law and language of the Contract

2.1 The Laws of Malta shall apply in all matters not covered by the provisions of the contract.

2.2 The language used shall be English.

Article 3: Order of Precedence of Contract Documents

The contract is made up of the following documents, in order of precedence:

(a) the Contract;
(b) the Special Conditions;
(c) the General Conditions;
(d) the Contracting Authority's technical specifications and design documentation;
(e) the Contractor's technical offer, and the design documentation (drawings);
(f) the bill of quantities/financial bid (after arithmetical corrections)/breakdown;
(g) the tender declarations in the Tender Response Format;
(h) any other documents forming part of the contract.

Addenda have the order of precedence of the document they are modifying.

Article 4: Communications

Further to the contents in the General Conditions, the communication details of the Contracting Authority are:

Fondazzjoni ghall-Patrimonju Kulturali ta' l-Arcidiocesi ta' Malta
The Archbishop's Curia, Saint Calcedonious Square, Floriana
FRN 1535
Tel: 2590 6400
Email Address: fond.pkam@gmail.com

Communications between the Contracting Authority and/or the Supervisor on one hand, and the Contractor on the other, shall be exclusively in writing and in the English language. Specific and standard procedures of communication (templates of request for information, contract submittal, site instructions, time of communication and for replies, frequency of meetings) shall be agreed among the Contracting Authority and the winning bidder within fifteen (15) days from the Commencement Date of the Contract, unless otherwise specified in these Special Conditions and in Section 4 – Technical Specifications.

Article 5: Supervisor and Supervisor's Representative

5.6 The Contractor shall be responsible to provide all access necessary for verifying and inspecting the works carried out and the items being provided

Article 6: Assignment

Requests from the contractor for a change in assignment will not be allowed except in the case of force majeure which results in the Contractor being unable to carry out the tasks assigned in the contract.

Article 8: Supply of Documents

8.4 Any documents and drawings prepared by the Contractor are to be submitted for approval to the Contracting Authority and the Supervisor, the procedure being agreed to between the parties as indicated in Clause 4 of the Special Conditions.

Article 9: Access to Site

9.1 In addition to sub clause 9.1 of the General Conditions, contractors may be required to suspend all or part of the works being carried out in order not to disturb any official function or activity held as indicated by the Contracting Authority. The contractor will be notified of such suspension of works at least 48 hours in advance and will not be eligible for compensation, apart from an extension of time.

9.5 The contractor is to note that access to the public/private buildings shall be maintained at all times and shall maintain pedestrian and vehicular access (where applicable) at all times.

To this effect, the contractor and his employees shall be required to abide by the instructions issued from time to time by personnel responsible for the security of the underlying/adjoining properties and shall ensure that all works are carried out without jeopardizing the security of the place.

Article 10: Assistance with Local Regulations

10.3 The contractor is responsible for complying with local regulations at his expense to ensure the project is compliant with all the relevant local regulations.

Article 11: The Contractor's Obligations

11.9 As per article 15.4 of the Special Conditions

11.11 Further to what is stated in the General Conditions, the requirements for Contractor's submissions are detailed in Section 4 Technical Specifications of this Tender.

11.14 Any delay to commence or progress with works caused by the Contractor's failure to provide, develop and update any of these documents to the satisfaction of the Supervisor and approving Authorities shall be at the Contractor's risk.

11.17 The Contractor, including all the subcontractors, has to comply with all the legislation and regulations concerning employment in Malta, especially the posting of Workers in Malta Regulations; and must liaise with the Department of Industrial and Employment Relations, Malta – DIER and Employment & Training Corporation – ETC, to notify about such workers, fill in the appropriate forms and submit the required documentation; and must provide copies of such notification forms to the Contracting Authority.

11.20 The Contracting Authority and the Supervisor shall make available, where applicable, the tender drawings (and any subsequent revisions to such drawings) to the Contractor at the latter's request and well as any drawings required to carry out the works as the need arises. Any such drawings will remain the property of the Contracting Authority and the Contractor may not reproduce or communicate them to third parties except with the Contracting Authority's agreement.

11.21 Further to Article 11.2 in the General Conditions, the contractor shall deploy the necessary resources so as to maintain a good progress of work on the site and shall also, where necessary, undertake to perform works outside normal working hours, and on public holidays and weekends at no additional cost to the Contracting Authority, so as to ensure the completion of the Works within the required time-frame, in accordance with the Technical Requirements and with the Period of Execution.

11.22 Where applicable, the Contractor shall submit working and shop drawings, installation drawings, technical data, as-built drawings and other required information to the Supervisor when so requested and within the timeframes requested by the Supervisor. The Supervisor may liaise with the Consultant to approve or otherwise. In the case of technical information and date, the contractor shall allow a minimum of seven (7) days for the Supervisor to comment. The Supervisor may request any drawing and any other document submitted by the Contractor to be revised or replaced and the Contractor shall so revise or replace the document within the requested timeframe and at the Contractor's own expense.

11.23 The Contractor shall draw-up and submit all other documentation required as stipulated elsewhere in these Special Conditions, as specified in the Technical Specifications and as otherwise instructed by the Supervisor within the stipulated, specified or requested time frames.

11.24 The Contractor shall be obliged to follow any and all instructions issued by the Supervisor in relation to the Works in so far as these fall within the overall scope of the Contract.

11.25 The Contractor shall be obliged to ensure avoidance of disruption and inconvenience to the day to day business on and around the site, including the co-ordination with other contractors that may be engaged on or in the vicinity of the site, the free movement of traffic and pedestrians, except where this is absolutely unavoidable. In particular, the Contractor shall take all such precautions as may become necessary so as to avoid causing any damage to adjacent buildings or property, including public spaces, during the execution of the Works.

11.26 The Contractor shall also, in addition to the above, take any necessary action to ensure and maintain the health and safety of his employees, together with those of the employees of any other contractor engaged on or in the vicinity of the site, together with the general public and shall follow any relevant instructions and /or recommendations of the contractor's Health and Safety Offices and the Contracting Authority Project Supervisor to fulfil the obligations set out in the Legal Notice 281/2004 (SL 424.29)

11.27 In addition to other obligations arising under the Contract pertinent to the execution of the Works, the Contractor shall, following completion of same, fulfill all obligations during the Defects Liability Period as outlined in Article 58.6 of these Special conditions.

11.28 The Contractor shall not dismantle the scaffolding prior to the approval of the Contracting Authority's architect and civil engineer in charge. The contractor shall give the Contracting Authority's architect and civil engineer in charge at least one week notice to allow for a final inspection and the measurement of works

11.29 A suitable "housekeeping" programme shall be established before commencement of the project, and be continuously implemented on the Site.

11.30 The Contractor will be available to attend regular site, management and progress meetings.

11.31 The contractor binds himself to adhere to the conditions imposed in the Planning Permit, that is, the approved drawings, document and conditions imposed in Planning Permit PA Nos 0379/20 as approved by the Planning Authority. He also binds himself to follow all instructions given to him by the Superintendence of Cultural Heritage.

Article 13: Performance Guarantee

13.1 The Contractor shall, within 15 calendar days of receipt of the contract, sign and date the contract and return it together with an original copy of the Performance Guarantee to the Contracting Authority. The amount of the guarantee shall be 4% where the amount of the total contract value is between €10,000 and €500,000 exclusive of VAT. If the same Contractor has more than one contract with the Contracting Authority, then the Contractor will be allowed to submit a single bid bond in accordance with the schedule stipulated in the Tender Form.

13.3 The performance guarantee shall be in the format given in Section 5 and shall be provided in the form of a bank guarantee. It shall be issued by a bank in accordance with the eligibility criteria applicable for the award of the contract.
Furthermore, the Contracting Authority will not affect any payment to the Contractor until the performance guarantee has been submitted.

13.8 The performance guarantee shall be released within 30 days of the signing of the Provisional Acceptance Certificate including any snag lists.

Article 14: Insurance

14.1.a Without any prejudice to Article 14.1 a, b, c of the General Conditions, the contractor is required to insure for the whole duration of the contract against risk of damage to the historic fabric of the building being restored through this contract for the amount of €235,000 per accident with the number of occurrences unlimited.

14.2 Without any prejudice to 14.1 a, b, c of the General Conditions, the contractor is required to insure for the whole duration of the contract for the amount of €1,500,000 per accident with the number of occurrences unlimited against each party's liability for any loss, damage, death or bodily harm, that may be caused to third parties, or to any person that is authorized to be on site at any given time, or any damages to property belonging to

third parties, including loss of profits that may be sustained by third parties.

14.3 Amount per personal injury and unlimited occurrences as specified in Article 14.2 of the Special Conditions.

Article 15: Performance Programme (Timetable)

15.1 The Contractor shall provide a detailed Programme of Works.

15.4 The Programme of Works shall be updated monthly or whenever required by the Supervisor, to be in line with the progress of the actual Works. The Programme of Works shall be accompanied by sufficient data and information together with all the necessary details of constructional plant, required labour force, etc. The Supervisor shall approve the Programme of Works within ten (10) working days from submission by the Contractor to the Supervisor. Should the Supervisor consider any alteration in or addition to the Programme of Works as submitted, the Contractor shall conform therewith without additional cost. Any changes to the Programme of Works shall be approved by the Contracting Authority.

Article 17: Contractor's Drawings/Diagrams

17.1 The Contractor shall submit to the Supervisor for approval any drawings, documents, programme of works, technical literature, samples and /or models that the Supervisor may reasonably require for the performance of the contract within 5 working days from written request by the Supervisor or from date when meeting where minutes are taken.

Article 18: Tender Prices

18.2 The contractor will ascertain that all the respective rates have included double handling, carting away and dumping fees

18.3 The Contractor shall be deemed to have taken into account in his tender price all works, fees and costs that are necessary to complete the project and to fully hand over in operational condition.

Article 19: Exceptional Risks

19.5 Further to the provisions of Article 19.5 of the General Conditions, if the Contractor is granted an extension of time in the implementation of the works, the Contractor cannot make a request for financial compensation for extension of time.

Article 20: Safety on Site

20.2 Further to the provisions of the General Conditions, it is the obligation of contractors to carry out a suitable, sufficient and systematic assessment of all the occupational health and safety hazards which may be present at the place of work and the resultant risks involved concerning all aspects of the work activity.

20.3 Further to the provisions of the General Conditions, it is also the duty of a contractor to cooperate with other employers, contractors and, or self-employed persons who share a common work place, on the implementation of Health and Safety provisions. The

contractor or his designate shall co-ordinate necessary actions in matters which concern protective and preventive measures, and shall inform all on site as well as the Health and Safety Project Supervisor regarding any potential risks.

Article 21: Safeguarding Adjacent Properties

21.1 Further to clause 21.1 of the General Conditions, the contractor shall liaise and co-operate with the appropriate Authorities and occupiers of adjoining land and buildings likely to be affected by the works, for all matters regarding access, monitoring, third party rights, and similar.

Article 22: Interference With Traffic

22.3 The Contractor is responsible to obtain necessary permits that may be required if the works impact of traffic.

Article 23: Cables and Conduits

23.3 The contractor shall be responsible for locating existing drains and services, and underground cables and pipes, for seeking instruction from the appropriate authorities as to how to deal with such services, and for carrying out any necessary work relating to deviations or protection, or any other works deemed necessary by the respective Utility or authority.

Article 25: Demolished Materials

25.1 Demolition material unless indicated otherwise in the bills of quantities and by the supervisor in charge, shall become the property of the Contractor and the carting away and dumping charges are at the expense of the Contractor.

25.4 Further to article 25.4 of the General conditions, the contractor shall also take care to dispose of the waste material fully at his expenses and in an appropriate and environmentally friendly manner.

Article 26: Discoveries

26.2 Further to provisions of Article 26.2 of the General Conditions, the Contractor shall observe the provisions set out in the Cultural Heritage Act 2002 (CAP 445) at all times.

26.3 Further to the provisions of Article 26.3 of the General Conditions, any in filled fissures, caverns, reservoirs/cisterns, hollows, Quaternary deposits, or other features of geological, geomorphological, hydrological, palaeontological interest which are discovered must be reported immediately to the Superintendence of Cultural Heritage. The contractor shall halt the works and follow all instructions given by the Supervisor to protect or to investigate further the discovery.

The Contractor shall co-ordinate and co-operate with the Supervisor appointed by the Contracting Authority with the Local Authorities at all times.

Article 28: Soil Studies

28.1 As per General Conditions of the Contract

Article 30: Patents and Licences

30.1 As per Article 30 of the General Conditions

Article 31: Commencement Date

31.1 The Commencement Date for this contract shall be 1 week from the Order to Start Works. The performance of the contract is to commence on order to start works. The order to start works will not be issued later than two (2) months from the last date of signature shown on contract.

No works however will be allowed to commence on site unless the Contractor has furnished the Contracting Authority with a certified true copy of the Insurance Policy together with all documentation related to Health and Safety as well as the performance guarantee.

Article 32: Period of Execution of Tasks

32.1 The period of performance of this contract shall be 40 **weeks** from the Commencement indicated in the Order to Start Works.

The contractor will be expected to commit sufficient resources to carry out works on more than one area at the same time, to guarantee the on time completion of all the Works as specified in this tender.

Article 33 Extension of the Period of Execution of Tasks

33.4 Further to the provisions of Article 33 of the General Conditions, should the Contractor be granted an extension of the period of execution of the tasks that are the subject of this contract, the Contractor cannot make a claim for financial compensation for such extension in the period of execution of the tasks of the contract.

Article 34: Delays in Execution

34.1 Any delay in performance from the approved programme of works for this contract, will be charged 0.1% of the contract value per calendar day of delay up to a maximum of 20% of the contract value.

Upon reaching the maximum penalty, the Contracting Authority reserves the right to terminate the contract and seek the services of a third party for the completion of works.

Article 35: Modification to the Contract

35.8 The Contracting Authority has a right to increase or reduce works of a similar nature by a maximum of 15% of the contract value which have become necessary for the purpose of achieving the scope of the contract. These inter alia include the detection of unidentified works evident only once the interventions have commenced such as the repetition of cleaning interventions due to stubborn dirt, the repetition of the application of biocides and herbicides, the consolidation, pinning, repair, stone replacement and re-pointing of areas of the stone fabric. Such works would be resulting from close inspection of works accessible only upon erection of scaffolding or exposed during the course of the works.

35.9 The Contracting Authority will have the right to instruct additional works up to a maximum of 15% of the contract value which have become necessary for the purpose of achieving the scope of the contract. Such works would be resulting from close inspection of works accessible only upon erection of scaffolding or exposed during the course of works. These inter alia include works evident only once the interventions have commenced such as the alternative cleaning and plastering interventions, the application of alternative treatment and utilization of other materials other than those envisaged in the tender specifications that may be required.

35.11 The provisions provided for in Article 35.11 of the General Conditions shall not be applicable to this contract.

35.12 The provisions provided for in Article 35.12 of the General Conditions shall not be applicable to this contract.

35.13 The provisions provided for in Article 35.13 of the General Conditions shall not be applicable to this contract.

Article 37: Work Register

37.1 The Contractor shall maintain a Work Register (Work Diary) on the site, containing detailed daily reports in the template specified and/or approved by the Contractor's representative (either the Construction/Project Manager or the Site Manager) and approved by the Supervisor, including at least the following information:

(a) weather conditions, interruptions of work owing to inclement weather, hours of work, number and type of workmen employed on the site, materials supplied, equipment in use, equipment not in working order, tests carried out in situ, samples dispatched, unforeseen circumstances, safety, health and welfare of persons and damage to property, progress of the Works, as well as progress of the Works orders given to the Contractor;

(b) detailed statements of all the quantitative and qualitative elements of the work done and the supplies delivered and used, capable of being checked on the site and relevant in calculating payments to be made to the Contractor;

(c) photographic records of the interventions as well as the state of the structures to be restored through this tender prior to the commencement of works. The photographs shall include records of any archaeological, historical, etc evidence discovered during the course of works; detailed mapping of all interventions carried out. The interventions shall be carefully mapped out in conformity to approved standards and conventions as agreed with and approved by the Supervisor in charge. This mapping shall be submitted to the Architect and Civil Engineer in charge/or Supervisor in digital format (Version ACAD 2009 or compliant) and 2 colour printed copies; copies of method statement reports, construction management plans and updated programmes of works as specified in this document and approved by the Supervisor.

This Work Register shall be made on daily basis and take the form of a bound document with an original and two copies for each day. The original shall be filled out by the Contractor, who shall sign it, then reviewed by the supervisor, who shall add his comments, if necessary, and countersign it. One copy shall be kept by the supervisor for its own record.

Entries made in the work register as work progresses shall be signed by the Contractor and countersigned by the Supervisor or his representative. When the Supervisor reviews each

page, he shall add his comments if necessary, to draw attention to deficiencies in the Works or to give warning of difficulties that may arise from the Contractors method of working. He may also instruct in this Work Register that work shall stop in certain circumstances and the Contractor shall take appropriate action immediately. Such instructions shall be followed up by Administrative Orders. If the Contractor objects, he shall communicate his views to the Supervisor within 15 days following the date on which the entry or the statements objected to are recorded. Should he fail to countersign or to submit his views within the period allowed, the Contractor shall be deemed to agree with the notes shown in the register. The Supervisor may examine the work register at any time and may make or receive a copy of entries which he considers necessary for his own record.

Article 38: Origin

38.1 No derogation to the rules of origin is authorised.

Article 39: Quality of Works and Materials

39.2 All designs, components, materials, and restoration interventions/methodologies shall be submitted to the Supervisor for written preliminary technical approval, prior to their implementation or procurement. All requests and documentation must be submitted with 10 calendar days prior to execution of works on site.

Article 40: Inspection and Testing

40.2 As specified in the General Conditions.

Article 42: Ownership of Plants and Materials

42.2 All equipment, temporary works, plant and materials on site owned by the Contractor or by any company in which the Contractor has a controlling interest shall, for the duration of the execution of the works be:

a) Vested in the Contracting Authority.

Article 43: Payments: General Principles

43.1 Payments will be made in Euro.

Payments shall be authorized by the Contracting Authority, and paid by the Treasury Department.

Payment Schedule		
Pre-financing Payment	As per 44.1 of Special Conditions	10% of contract value
Interim Payments	As per measured works	95% of contract value
Retention Monies	As per payment schedule in Clause 45.2 of the Special Conditions	5% of contract value

43.3 As per General Conditions.

Article 44: Pre-financing

44.1 Pre-financing to the Contractor of 10% of the contract value excluding the cost of maintenance items in the BOQ, shall be obligatory.

44.2 Pre-financing amounting to 10% of the contract value shall be granted to the Contractor against the provision of a bank guarantee by Contractor in favour of the Contracting Authority of the equivalent amount.

44.3 Further to Article 44.3 of the General Conditions, the Contractor shall present to the Contracting Authority, within forty five (45) days of the signing of the contract, a bank guarantee of the amount equivalent to 10% of the contract value for the Contracting Authority to release the pre-financing payment of the same amount.

44.8 The pre-financing payment shall be repaid through percentage deductions in payment certificates as follows:

(a) Advance payment equivalent to 10% of the contract value:

▫ Deductions shall commence in the payment Certificate in which the total of all certified interim payments (excluding the advance payment and deductions and repayments of retention) exceeds 10% of the Accepted Contract Amount; and

▫ Deductions shall be made at the amortisation rate of 10% of the cumulative amount of each payment certificate (excluding advance payment and deductions and repayments for retention) in the currency and proportions of the advance payment, until such time as the advance payment has been repaid in full; and

▫ With every 25% of the pre-financing amount being amortised, the Contracting Authority may authorize the relevant financial institution to release the equivalent 25% from the pre-financing guarantee granted in terms of Article 44.3 of these Special Conditions. Thus, the pre-financing guarantee shall decrease proportionately throughout execution of the contract.

Article 45: Retention Monies

45.2 The sum of money retained from the interim payments shall be of 5%. This sum shall be paid upon submission of an equivalent retention bank guarantee (issued in the form provided in this tender document) by the Contractor to the Contracting Authority when issuing the Provisional Acceptance Certificate as specified in Article 57. The bank guarantee will be released upon issuing of the final acceptance of the works as per Article 58. The said retention guarantee shall be released only after the conditions requested under Art 58 are satisfied. The retention guarantee will be released within 45 days from when the Final Acceptance Certificate is issued.

Article 46: Price Revision

46.1 Tender prices are fixed and not subject to revision with the exception of that resulting from causes listed under Article 46.3 of the General Conditions.

46.3 As per General Conditions

Article 47: Measurement

47.2 The works shall be measured as detailed in the Bill of Quantities, and as specified in the appropriate clauses in the Technical Specifications – Section 4. The appointed contractor shall satisfy the Supervisor that the materials are such as specified or equivalent.

Article 48: Interim Payments

48.1 Interim Payments of sums due for the executed and provisionally accepted works shall be authorized by the Contracting Authority and payment will be issued by the Treasury Department within the Ministry of Finance paid against a valid invoice after works in accordance to quality and progress of works. The retention shall be released in accordance to Clause 45.2 of these special conditions. The Contractor shall submit his claim for progress payments to the Contracting Authority in writing. Such claims are to be supported by evaluation of the works executed and materials installed on site and show the value of the permanent works executed by him up to the end of the month. All claims shall be evaluated by the Contracting Authority in relation to the Bills of Quantities and Contract Rates and documentation produced by the Contractor and on the basis that such works have been executed in accordance with the Contract Documents and to the satisfaction of the Contracting Authority. Provided the Contracting Authority agrees with the statement, the relevant Payment Certificate will be issued.

Article 50: Delayed Payments

50.1 The Contracting Authority shall pay the contractor sums due within 60 days of the date on which an admissible payment is registered, in accordance with Article 43 of these Special Conditions. This period shall begin to run from the approval of these documents by the competent department referred to in Article 43.1 of these Special Conditions. These documents shall be approved either expressly or tacitly, in the absence if any written reaction in the 30 days following their receipt accompanied by the requisite documents.

50.2 Once the deadline laid down in Article 50.1 has expired, the Contractor may, within two months of late payment, claim late-payment interest:

- at the rediscount rate applied by the issuing institution of the country of the Contracting Authority;

on the first day of the month in which the deadline expired, plus two percentage points (2%). The late-payment interest shall apply to the time which elapses between the date of the payment deadline (exclusive) and the date on which the Contracting Authority's account is debited (inclusive).

Article 53: End Date

The contract will be co-financed through the European Regional Development Fund 2014-2020, therefore the payment obligations of this contract will be concluded by end December 2022.

Article 56: Partial Acceptance

56.2 The supervisor will issue partial provisional acceptance upon completion of full works on the structure envisioned within the contract and not upon completion of works on parts of the structure envisioned within the contract.

56.3 The maintenance period shall run from the date of the Provisional Acceptance Certificate issued as per Article 57.

Article 57: Provisional Acceptance

57.6 Further to the provisions of Article 57 of the General Conditions, the Provisional Acceptance Certificate can only be issued once all pending snags included in the relevant snag list are appropriately addressed by the Contractor and to the satisfaction of the Supervisor.

Article 58: Maintenance Obligations

58.6 Further to the provisions of Article 58 of the General Conditions, the contractor shall guarantee that works carried out through works specified in this tender document are adequately maintained for a period of 24 months from issuing of the Provisional Acceptance Certificate. The Contractor shall be responsible for remedying, at his expense, defects and damages during this period as specified in the General Conditions.

Any remedial works performed during the guarantee period (until 24 months after completion of ALL works described in this contract) shall be carried out as specified in this document and approved by the Supervisor. The contractor shall be responsible for providing all suitable means, for obtaining all permissions, and making all the necessary arrangements with all authorities concerned to carry out all the remedial works at any height levels at no extra cost to the Contracting Authority.

Article 66: Dispute Settlement by Litigation

If no settlement is reached within 120 days of the start of the amicable dispute-settlement procedure, each Party may seek:

a) either a ruling from a national court, or

b) an arbitration ruling, in the case where the parties, i.e. the Contracting Authority and the Contractor, by agreement decide to refer the matter to arbitration.

Article 70: Further Additional Clauses

70.1 The Supervisor will organise project management meetings (which may be held in person or on-line) and site meetings. The Contractor's representative must also attend these meetings in order to review the arrangements of future work. The Supervisor shall record the business of these meetings and supply copies of the record to those attending the meeting and Contracting Authority. In the record, responsibilities for actions to be

taken shall be in accordance with the contract.

The Contractor's Key Experts must also attend these meetings when requested by the Supervisor and/or the Contracting Authority. The Supervisor shall notify the Contractor of the requirement of a particular Key Expert's attendance at least three (3) days prior to the meeting. The Contractor shall become liable to a penalty of €100 (one hundred euro) for each occurrence in which a Key Expert fails to attend meetings. Such penalties will be deducted from the next interim payment due.

70.2 Following the issue of an administrative order by the Supervisor, the Contractor shall execute the administrative order within the specified deadline. Without prejudice to other penalties which may be due in terms of the Contract, if the Contractor fails to respect the specified deadline for the respective administrative order, Contractor shall be liable to a penalty for mere delay in execution of the administrative order in the amount of €100 (one hundred euro) for each calendar day following the deadline until Supervisor certifies the completion of the administrative order, which penalty shall be deducted from the next interim payment.

70.3 The Contractor shall be liable to a penalty of €2,000 (two thousand euro) if he fails to abide with any of the conditions of permits for works issued by ERA [Environment and Resources Authority], the PA [Planning Authority] and the BRO [Building Regulation Office] or any other Malta Government Authority and related to or in connection with this contract. This penalty shall be applied for each occurrence where the result of the non-compliance is irreversible. In case the effects and results of the non-compliance are reversible the contractor shall be liable to a penalty of €1,000 per calendar day commencing from the deadline set by the Supervisor to complete the remedial works. The reversibility of the breach of permit conditions shall be determined by the Supervisor. The penalties in this Article shall apply without prejudice to the other penalties that may be issued by the Planning Authority and/or other Governmental Entities. Penalties will be deducted with the next interim payment due.

SECTION 4 –SPECIFICATIONS/TERMS OF REFERENCE (Note 3)

Note:
Where in this tender document a standard is quoted, it is to be understood that the Contracting Authority will accept equivalent standards. However, it will be the responsibility of the respective bidders to prove that the standards they quoted are equivalent to the standards requested by the Contracting Authority.

TECHNICAL SPECIFICATIONS

FOR THE RESTORATION WORKS OF THE MAIN FAÇADE AND THE SIDE FAÇADE ON THE SOUTH SIDE AND SIDE OF THE SACRISTY OF THE CHURCH OF THE ASSUMPTION OF QRENDI

SPECIFICATIONS FOR RESTORATION WORKS

General Site Management Practice

Main scope of works
The main scope of this tender is to restore the main façade and the side façade on south side and side on sacristy.

Liaison

A.1 The contractor shall liaise and co-operate with the appropriate Authorities and occupiers of adjoining land and buildings likely to be affected by the works, for all matters regarding access, monitoring, third party rights, and similar, as per Clause 21.1 of the Special Conditions.

Cordination of Services

A.2 The contractor shall be responsible for locating existing drains and services as per Clause 23.3 in Special Conditions

A.3 Access Roads
The contractor shall take all the necessary steps to ensure that the external areas and access roads are left clean and tidy during all stages of the work, to the satisfaction of the Architect and civil engineer in charge.

Method Statement and Programme of Works

A.4 Apart from the preliminary Method Statement and the Programme of Works to be submitted by the bidder, with the tender document, the successful bidder shall be required to submit a detailed Method Statement together with a Programme of Works, and Construction Management Plan prior to commencement of works. The Method Statement shall include a Risk Assessment, as referred to in this document. It shall also detail site logistics and plant locations. The Contractor shall take into account the problems of access into the site, and in particular the needs to maintain access open to the sites for both visitors as well as other contractors.

A.5 The detailed Programme of Works,(Gantt Chart) shall identify each activity, indicating the dates when works in their various phases would be undertaken, for approval of the Architect and Civil Engineer in charge.

A.6. The Programme shall be updated monthly or whenever required by the Architect, to be in line with the progress of the actual Works. The Programme shall be accompanied by sufficient data and information together with all the necessary details of constructional plant, required labour force, etc. Should the Architect consider any alteration in or addition ot the Programme as submitted, the Contractor shall conform therewith without additional cost to the Contracting Authority.

A.7 The submission to and approval by the Architect of such Programme or the furnishing of such particulars shall not relieve the Contractor of any of his/her duties or responsibilities under the Contract.

Housekeeping

A.8 Storage areas for materials, plant and construction waste shall be enclosed with secure hoarding; the different areas for materials, waste and staff facilities will also be fenced in for security, for the protection of the public, as well as to reduce, visual impact. Construction

waste shall not be allowed to accumulate on site and should be removed periodically. The contractor shall endeavour to locate the storage and stockpile areas in the areas from where there will not be a significant visual impact on views of the fortifications

A.9 Rainwater run-off shall be channelled to setting ponds that will allow the separation of the silt from the clear water. Sludge will be collected regularly using mobile suction pumps, and will be deposited at an approval dumping site.

A.10 The disposal of hazardous waste shall be carried out in accordance with procedures approved by the Environment Protection Department and the Malta Environment and Planning Authority. Any hazardous material shall be notified to the Environment Protection Department, and shall be transported in accordance with the relevant Maltese Legislation. Relevant hazardous wastes include, but are not limited to, petroleum tank bottom sludge, waste acidic of alkaline solutions, wastes containing metals, waste hydraulic, engine, or bilge oils, degreasing agents or solvents, discarded equipment containing PCBs or asbestos. Waste explosives, batteries and accumulators, soil, stone or construction and demolition waste containing dangerous substances, and insulation material containing asbestos.

A.11 Sanitary waste during the construction phase shall be disposed of chemically.

A.12 Burning of waste plastics, wood or any other material on site shall not be allowed.

A.13 All activities producing dust shall be controlled, and measures such as spraying with water shall be used to ensure that the emitted dust is minimised. Dust-laden materials shall be removed from the site, and transported through public thoroughfares, only after thorough watering before leaving the site. Dust covers, of appropriate material, properly secured along all sides, shall be used on all open-topped vehicles used for the transportation of rubbish or debris from the site.

A.14 Wash-down facilities may need to be installed at the designated exit of the site of the works, to minimize any dust carried by construction vehicles on the public roads, unless it can be shown that the contractor can otherwise control the dust carried by his vehicles. Wash-down facilities shall normally consist of a power washer, surface gutters and a system of interconnected reservoirs underlying the washing area, so as to allow construction vehicles, leaving the site, to be washed-down. The water from the wash-down should flow through the gutters into the underground reservoirs, and clear water will overflow from one compartment into the next, depositing the silt load. A submersible pump will recycle the water form the last compartment and feed it to the power washer. Sludge will be collected regularly using mobile suction pump, mixed with the excavated debris to remove excess water, and disposed of with the same excavated material.

A.15 All plant shall be operated with any relevant doors closed, and shall be fitted with silencers and noise suppressors. All plant and site operations will be required to conform to local legislation, and in particular EN ISO 11690, EN 12096, EN 28662, EN ISO 10819, EN ISO 8662. The contractor shall select and utilise methods of working, and items of plant, so that the maximum measured ground vibrations do not exceed a peak particle velocity of 3mm per second at any occupied property, and 5mm per second at other properties, or any other values indicated by the relevant Authorities. Noise levels at the perimeter of the site shall not exceed 70dB, or the value indicated by the relevant Authorities.

A.16 Any chemical drums that may need to be on site shall be stored on impervious surfaces in designated bunded areas. Oil tanks shall be similarly stored. The bunds shall have a capacity equal to 110% of the volume of the largest drum. In view of the fact that the bunds are meant to cater for operational leakages and spills, this is considered as sufficient. The bunds shall have no drains, and provision shall be made for pumping out rainwater. Filling and vent pipe-work shall be located inside the bund. The bunds shall be available for inspection. Empty drums shall be stored in a similar fashion, in separate areas, and shall be safely disposed of in accordance with the arrangements made with the Environment Protection Department.

A.17 Oil drip trays shall be used under small static plant, such as pumps and compressors. These trays shall be open to inspection and spent oil shall be disposed of in accordance with the arrangements made with the Environment Protection Department. Maintenance areas for the

construction plant shall be indicated in the Contractor's Construction Management Plan. Disposal procedures shall be as instructed by the Environment Protection Department. The contractor shall be required to install settling ponds to stop oil-contaminated, or silt-laden, waste water, (including rain-water), from finding its way into the surrounding cultivated agricultural areas.

A.18 The contractor shall take all necessary procedures to control energy use on site. Site lighting shall be, as much as possible, low energy, or energy-efficient, light fixtures, and shall be downward pointing and shielded to avoid unnecessary light loss and light pollution.

A.19 The Contractor shall comply with and fulfil all obligations imposed by Article 19 of the Police Laws and shall give all notices, obtain all permits; pay all fees that may be lawfully demanded by Public Officers in respect of works and comply with all requirements of the Law and any Lawful Authority.

Notice to authorities

A.20 The contractor shall give all necessary notices to authorities concerned and shall allow them facilities for removing any fixtures, fittings, or services, which may belong to them.

Heavy vehicles

A.21 The use of heavy construction vehicles entering Qrendi in connection with this project shall be limited to the minimum and confined to specific routes, agreed upon beforehand with respective Authorities.

Materials

A.22 All materials and methods of construction shall be in the form and nature specified herein and/or as indicated in the drawings, to the satisfaction of the Contracting Authority's Architect-in-Charge. All materials and methods (except where otherwise stated) shall conform to the relevant British Standard Specification or its European equivalent.

Samples and tests

A.23 During the course of works, architect and civil engineer in charge reserves the right to take samples or carry out specialised tests on site. In specific cases, analysis/tests on samples elevated may take significant time to be completed, in which case, architect and civil engineer in charge may request suspension of all or part of the activities being carried out by the contractor. Unless such tests/ analysis are being carried out due to any negligence, bad workmanship, etc. from the contractor's side, the Contracting Authority or his/ her representative may opt to prolong the completion period as detailed in tender document. Should, however, the need for such tests arise due to any negligence, bad workmanship, etc. by the contractor, expenses incurred in the carrying of such tests will be deducted from payments due to the contractor. In the Period of Execution of the work the Contractor will have to factor in such tests.

Works to be carried out by other entities/or contractors

A.24 During the course of works, the Restoration Directorate may:

a) Assign other contractors/ personnel to contemporarily carry out works on other areas of the building not included in this tender document.
b) Appoint personnel to carry out trials, tests, etc. on cleaning methods, consolidation, etc. as so deemed necessary by the architect and civil engineer in charge, on sections of the building covered by this tender document.
c) In all cases, contractor will be expected to be co-operative and allow the use of his scaffolding and/ or other facilities available on site for the efficient execution of the above-mentioned works. Same contractor will not be entitled to any compensation (financial or otherwise) for these services, etc.

Clearance of site

A.25 Each trade is to make good after itself and provision for such work shall be made in respective rates.

A.26 During the execution of the works, the Contractor shall keep the site reasonably free from all unnecessary obstruction, and shall store or dispose of any Contractor's equipment and surplus

materials and clear away and remove from the site any wreckage, rubbish or temporary works no longer required.

A.27 On completion of the Works, the Contractor shall clear away and remove from site all Contractor's equipment, surplus material, rubbish and temporary works of every kind, and leave such part of the site and works clean and in a workmanlike condition to the satisfaction of the Contracting Authority's Architect and civil engineer in charge.

Management Plan

A.28 The Management Plan shall be compiled to show how access to the site will be managed, how security and safety of the buildings will be guaranteed, and how building material and building waste will be handled to ensure minimum impact. It will also detail site logistics and plant locations, and equipment etc. to be used in the execution of works indicating the contractor's endeavours to carry out the works requested by the Contracting Authority's architect and civil engineer in charge.

A.29 The Contractor shall take into account the problems of access into the site, and the existing physical site constraints in particular the needs to maintain access open to the sites for both visitors as well as other contractors. It shall show in particular:

- The Access Plan - All site access points for workers, plant and machinery.
- Storage areas for materials and plant
- A detailed Programme of Works, (Gantt chart), indicating the dates when works in their various phases would be undertaken and broken down into more detail for each activity of each phase, for approval of the Contracting Authority's Architect in Charge.
- Adequate and suitable provision to reduce dust nuisance during all phases of the works.
- Protection measures for overlying and adjoining retained buildings, structures and landscapes.
- Measures for the safety and continued operation of overlying existing activities.
- The location of disposal sites for material from demolition and excavation, and the means and routing of transport to disposal sites.

The submission to and approval by the Contracting Authority's Architect and civil engineer in charge of such Programme or the furnishing of such particulars shall not relieve the Contractor of any of his/her duties or responsibilities under the Contract.

Health and Safety Provisions

Safety Officer

A.30 The Contractor shall appoint his safety officer to ensure compliance with Legal Notice 281/2004 (SL.424.29). The safety officer shall amongst other things implement all regulations and directions given in order to achieve the objectives of the Health and Safety Plan, as well as ensure the certification of scaffolding, hoists and any other equipment/machinery to be used on the site of works as fit for the intended works and immediately submit them to the Contracting Authority. The Contractor shall be obliged to immediately carry out any actions recommended by the Contracting Authority Project Supervisor.
The Contracting Authority reserves the right to request the Contractor to substitute the appointed safety officer if in the opinion of the Contracting Authority he/she is not fulfilling his/her role properly.

The Contractor shall include inter alia for the following:

- All visitors are to be provided with appropriate personal protective equipment
- Provide appropriate induction and training to all visitors on site.
- Submit to the architect and civil engineer in charge, work methods and risk assessment for all works to be carried out. Such documents to be kept up to date throughout the works

- Prepare and submit to the architect in charge, weekly reports regarding health and safety on site, including actions plans to rectify non- conformities and prevent unsafe work practices and conditions.
- Maintain an occupational health and safety disciplinary system on site which is to include warning to personnel leading to dismissal for repeated offences.

The architect and civil engineer in charge may require the immediate removal from the Site of Works of any person who, in his opinion, fails to observe the provisions of this clause and such person shall not again be employed upon the Works without the permission of the architect and civil engineer in charge.

General Hazards

A.31 The following hazards have been identified:

a) Electrocution from buried/overhead electricity services and by electrically powered equipment/ machinery used on site of works;
b) Workers falling from scaffolding, or from heights on existing buildings;
c) Noise and dust production as a result of the works outlined in this document;
d) Workers crushed by collapse of structures and/ or scaffolding;
e) Inhalation of fumes resulting from restoration processes.
f) Full or partial collapse of scaffolding.
g) Third parties injured by material falling from scaffolding.

Risk Mitigation Measures

A.32 The following measures are recommended to minimise risks on site:

a) Clear delineation of plant movement areas;
b) Double checks on possible existence of buried services – clear delineation of known services;
c) Provision of sturdy work platforms/ scaffolding, and guide rails at unprotected edges of existing buildings;
d) Use of plant with limited noise emission;
e) Periodic wetting of demolition area to reduce dust emission;
f) Establishing clear procedural rules during overhead material handling to;
g) Enforcement of hard hats.

Provisions for safe practice

A.33 The following provisions shall be made, without limiting, in any way, other provisions that the Contractor may deem necessary in order to render the Site and the Work safe:

a) Where there is an imminent danger to the safety of workers, the Contractor shall take immediate steps to stop the operation and evacuate workers as appropriate;
b) Secure fencing, to prevent unauthorised access to the active work areas;
c) A Notice, giving information on the specific hazards, and on the availability of emergency assistance, shall be clearly displayed in a position such that those working on site can read it as well as those affected by the Site;
d) Routes for the movement of vehicular traffic around the place of work shall be clearly delineated. These routes shall be separated from the areas subject to overhead movements;
e) Escape routes and means of escape shall be kept clear at all times;
f) Existing services, both overhead and underground, within the work site and immediately surrounding the work site, shall be identified, the respective utility companies contacted for information and disconnected/made safe;
g) Special attention shall be given to lifting, slewing and overhead handling operations to avoid public access areas;
h) The Contractor shall take appropriate measures, or shall use the appropriate means, in particular mechanical equipment, in order to avoid the need for the manual handling of loads by workers;
i) All openings through which workers are liable to fall shall be kept effectively covered or fenced and marked in the most appropriate manner;

j) Where natural lighting is not adequate to ensure safe working conditions, the Contractor shall provide adequate and suitable lighting, including portable lighting when appropriate, at the Site of work;
k) Guard-rails and toe-boards shall be provided to protect workers from falling from elevated workplaces; alternatively, adequate safety nets or safety sheets shall be erected, made fast and maintained, or adequate safety harnesses shall be provided and used;
l) Hoist shafts shall be enclosed with rigid panels or adequate fencing at ground level on all sides;
m) The contractor shall be responsible for ensuring that all persons on the Site, whether the Contractor's employees or otherwise, wear the necessary personal protective clothing at all stages;
n) The Contracting Authority's Engineer shall have the right to send away any of the Contractor's employees, or of his Sub-Contractors, or otherwise doing work on the site, if they do not comply with these requirements.

Fire Outbreak

A.34 The Contractor shall take all appropriate measures to:
a) Avoid the risk of fire;
b) Control quickly and efficiently any outbreak of fire;
c) Bring about a quick and safe evacuation of persons.

Protective Clothing and Equipment

A.35 The Contractor shall provide the following:
a) Safety helmets or hard hats to protect the head from injury resulting from falling or flying objects, or from striking against objects or structures.
b) Goggles, a screen, a face shield or other suitable device when likely to be exposed to eye or face injury from airborne dusts or flying particles, dangerous substances, harmful heat, light or other radiation, and in particular during welding, flame cutting, or other hazardous work;
c) Protective gloves and suitable protective clothing to protect hands or the whole body when exposed to heat radiation or while handling hot, hazardous or other substances such as poultice packs which might cause injury to the skin;
d) Footwear of an appropriate type when employed at places where there is the likelihood of exposure to adverse conditions, or of injury from falling or crushing objects, hot or hazardous substances, sharp-edged tools or nails;
e) Respiratory protective equipment, suitable for the particular environment when workers cannot be protected against airborne dust, vapours or gases by ventilation or other means;
f) Safety harnesses with independently secured lifelines where protection against falls cannot be provided by other appropriate means.
g) Waterproof clothing and head coverings when working in adverse weather conditions.

Storage of Materials

A.36 The Contractor shall ensure:
a) A safe, sufficient and suitable storage for flammable liquids, solids and gases such as ethyl silicates and/ or fuels.
b) Storage areas for flammable liquids, solids and gases shall be rendered secure against trespassers.
c) Smoking shall be prohibited and "No Smoking" notices or appropriate design and shape shall be prominently displayed in all spaces containing readily combustible or flammable materials.
d) Combustible material such as scrap wood or plastics, oily/greasy waste, sawdust or packing material shall not be allowed to accumulate in places of work, but should be kept in closed metal containers in a safe place.

Lifting Equipment

A.37 The Contractor shall ensure:
a) Any lifting gear or equipment intended for lifting shall not be loaded beyond its safe working load or loads as specified by the manufacturer.
b) No person shall be raised, lowered or carried by a lifting appliance unless it is constructed, installed and used for that purpose, except in an emergency situation.
c) Every platform or receptacle used for hoisting any loose material shall be so enclosed as to prevent the fall of any of the material.

d) Any equipment with wheels, placed directly on a platform for raising or lowering, shall be so secured so that they cannot move, and the platform shall be enclosed as necessary to prevent the fall of the contents.

'Housekeeping' Program

A.38 The Contractor shall ensure:

a) A suitable "housekeeping" programme shall be established, and be continuously implemented on the Site.

b) Areas within the Site, which are liable to become slippery, because of oil or other causes, shall be regularly cleaned up, or strewn with sand or sawdust.

c) It shall include provisions for the proper storage of materials and equipment, and for the removal of scrap, waste and debris at appropriate intervals.

d) Loose materials that are not required for use shall not be placed or allowed to accumulate on the site, so as to obstruct means of access to, and egress from, places of work and passageways.

A 39 Machinery and Equipment

The Contractor shall ensure:

a) All manual tools, pneumatic tools, electrical tools, etc. shall be suitable for the work to be carried out, shall conform to approved standards and regulations, shall be safe and such that they can be operated without risk to health.

b) They shall be provided with protective guards, shields or other devices as appropriate, which shall be maintained regularly, which shall be equipped, where applicable, with an extraction system which shall be as close as possible to any source of the dust, and which sucks away from the breathing zone, not through it, shall be fitted with shock absorbing materials, and be fitted with noise control protection devices at source to reduce as much as possible noise exposure.

c) Only insulated or non-conducting tools shall be used on or near live electrical installations if there is any risk of electrical shock. Only non-sparking tools shall be used near or in the presence of flammable or explosive dust or vapour.

d) Operating triggers on portable pneumatic tools shall be so placed as to minimize the risk of accidental starting of the machine, and so arranged as to close the air inlet valve automatically when the pressure of the operator's hand is removed. Hose and hose connections for compressed-air supply to portable pneumatic tools shall be designed for the pressure and service for which they are intended, fastened securely to the pipe outlet, and equipped with a safety chain, as appropriate. Pneumatic shock tools shall be equipped with safety clips or retainers to prevent dies and tools from being accidentally expelled from the barrel. Pneumatic tools shall be disconnected from power and the pressure in hose lines released before any adjustments or repairs are made.

e) Portable electric tools shall generally be used on reduced voltage to avoid as far as possible the risk of lethal shock. All electrical tools shall be earthed, unless they are "all insulated" or "double insulated" tools which do not require an earth. Earthing shall be incorporated in metallic cases, and as a safeguard against damaged cables, where wires enter the tool. Electric tools shall be fitted with protection guards that are regularly maintained for their effectiveness. Power cables to electrical tools shall be armoured and/or covered in thick flexible rubber, and socket outlets shall be of special design for outdoor use, and protected by a residual current circuit breaker.

f) All electrical tools shall receive inspection and maintenance on a regular basis by a competent electrician, and complete records kept.

g) The cables of portable electrical lighting equipment shall be of adequate size and characteristics for the power requirements and of adequate mechanical strength to withstand severe conditions in construction operations.

h) All vehicles shall be of good design and construction, taking into account established ergonomic principles, particularly with reference to the seat; they shall be maintained in good working order, shall be used with due regard to health and safety, by workers who have received appropriate training.

i) Where appropriate, earth-moving or materials-handling equipment shall be fitted with structures designed to protect the operator from being crushed should the machine overturn, and from falling material.

j) All vehicles and earth-moving or materials-handling equipment shall be fitted with a plate indicating the gross laden weight; the maximum axle weight or, in the case of caterpillar equipment, ground pressure.

k) Plant, machinery and equipment shall be switched off when not in use and isolated before any major adjustment, cleaning or maintenance is performed. Where trailing cables or hose pipes are used they shall be kept as short as practicable, be mechanically protected and not be allowed to create a safety hazard.

l) Mobile high pressure compressor plants and equipment shall be examined, tested and certified annually by a mechanical Engineer having a warrant to practice his profession.

m) Portable compressors shall be fitted with a double adjustable tow-bar and jockey wheel. When the plant/equipment is in operation, wheel chocks shall be installed. The wheels must be fitted with brakes that are operated automatically via a handbrake for parking purposes.

n) Only competent persons shall operate and maintain such plant and equipment.

Personnel

A.40 The Contractor shall assign the following Key Personnel. It is understood that the same person may be nominated to cover more than one of the mentioned roles:

a) **A Warranted 'Perit'** enabling him/her to practice locally as a Perit (as defined under Chapter 390 of the laws of Malta) and who will assume all the responsibility in terms of the legal obligations as arising under Maltese law. The role of the Perit is to also assist in the technical supervision and co-ordination as well as to ensure that the quality of the work is as requested by the Contracting Authority and the Supervisor.

b) **A Restoration Technician** having at least an MQF level 4 qualification or equivalent in restoration works of a similar nature. The restoration technician is to be familiar with the materials and restoration methodologies explained in the specifications and will take a leading role in the carrying out of these restoration interventions. The restoration technician shall be on the site of works <u>at all times</u>.

c) **A licenced Mason** with a valid building license to carry out building works locally and will be responsible for any demolition, building and stone replacement interventions.

d) **A warranted Conservator/Restorer** (having at least a B.Cons (Hons) with MQF Level 6 or equivalent qualification in restoration) in restoration works of a similar nature as long as the areas of study include stone. The conservator/restorer is to be familiar with the materials and restoration methodologies explained in the specifications, will provide assistance to the Supervisor and the Restoration Technician in more sensitive or specialized assessments and interventions. He/she shall be expected to be on the site of works regularly and to attend on-site weekly meetings with the Contracting Authority's representative with the intent of planning/managing/ supervising the execution of restoration interventions for the week ahead. He/ she shall moreover be expected to personally execute delicate/specialised restoration interventions including but not limited to the execution of tests, surface render colour sections and samples, cleaning trials, lime/ epoxy injections, stone fabric consolidation interventions etc. The stone conservator/restorer shall assume full and sole responsibility for the execution of all restoration interventions.

e) **A Resident Site Manager** (MQF level 4 in related areas of study) responsible for the works - to oversee and co-ordinate the works with the architect in charge of the project. He or she shall act as a single point contact for the duration of works and shall be responsible for on-site works. It is to be understood that the Site Manager shall be on the site of works <u>at all times.</u>

f) **A Quantity Surveyor** (MQF level 4 in Construction or Civil Engineering) responsible for the measurement of the works. He or she shall act as a single point contact for the duration of works and will liaise with the Contracting Authority's Supervisor and Quantity Surveyor.

Contractor shall also ensure:

a) The Contractor shall assign workers only to employment for which they are suited by level of training, age, state of health and skill, and having ensured that the workers are fully aware of any risks to health or hazards connected with the work, and that they are trained in the precautions necessary to avoid accidents or injury to health. Such training shall be given in a language that is understandable to the workers. The training shall be sustained periodically and shall take into account any new or changed risks to the health and safety of the employees concerned.

b) When the use of equipment is likely to involve a specific risk to the health or safety of workers, the Contractor shall take the measures necessary to ensure that:

(i) the use of equipment is restricted to those persons given the task of using it, and who have been adequately trained for the specific task;

(ii) in the case of repairs, modifications, maintenance or servicing, only competent workers are specifically designated to carry out such work;

(iii) all operators of construction equipment shall receive basic training as per Code of Practice provisions;

(iv) drivers of heavy machinery shall have followed an approved course in relation to the equipment to be used or driven and be in possession of a valid license.

Maintenance

A.41 All equipment/plant shall be certified to be in a proper working order, and shall be operated by trained personnel.

Noise Emissions

A.42 The Contractor shall ensure:

a) Noise emission levels from the plant/ equipment must conform to approved local standards, and in particular EN ISO 11690.

b) The exhaust system from any engine used on site must be fitted with a residual silencer.

Cranes

A.43 The Contractor shall ensure:

a) All lifting equipment used on site shall be certified by a warranted Mechanical Engineer every six (6) months, in accordance with the regulations issued by the Occupational Health and Safety Authority.

b) Copies of the certificates shall be sent to the Architect and civil engineer in charge/Project Manager before commencement of work and as necessary.

c) Failure to comply or to update these certificates will lead to an automatic penalty.

d) Further measures shall be taken to protect cranes against the effects of bad weather and lighting.

Temporary Electrical Installation

A.44 Any temporary electrical installation on the Site shall meet the requirements of Enemalta and/ or local legislation and in particular legal notices/ regulations issued by the Malta Resources Authority.

A.45 Any temporary electrical installation shall be certified by an independent warranted electrical Engineer, every three (3) months, and the certificate shall be affixed in a prominent position next to the Main Temporary Switchboard.

B. General Outline of Works

B.1 Main scope of works

The main scope of the works includes restoration works on the main façade and south side facades of the Church dedicated to St Mary in Qrendi.

Works include mainly the restoration of the masonry fabric, and envisage also the restoration of some timber apertures and wrought iron grilles present.

The Contractor shall be responsible to ensure that the works carried out are adequately maintained for a period of 24 months from completion of all works as specified in this document. During the maintenance period, as specified in this document, the Contractor will be expected to maintain the completed works in good condition.

B.2 LIST OF RESTORATION WORKS

B.2.1 Erect hoarding around site to avoid third party entry into the area where the works are to be carried out.

B.2.2 Erect scaffolding against the monument to be restored and neatly cover with a tarpaulin. Given the nature of works, scaffolding may be erected in such a manner as to cover a minimum of one whole façade and to the full height of the façade, however, always permitting the scaffolding to overlap in the corners on the already restored sections of the facade. Allowance to work at the corners should also be made.

B.2.3 Using methods approved by Contracting Authority's architect and civil engineer in charge, remove all vegetation and redundant cables, rain water pipes and all other ferrous and non-ferrous objects nailed/ fixed to structure. Given the friable nature of the deteriorated stone in particular areas, it is important that works be carried out sensitively such as not to dislodge any of the delaminated stone.

B.2.4 Carefully and using only hand tools (no power tools shall be used, unless specifically requested by Contracting Authority's architect and civil engineer in charge), remove loose pointing, superficial layers of whitewash identified by the architect and civil engineer in charge to be removed, and any cement mortar from all joints. **Joints which are still in good condition willnot be removed.**

B.2.5 If applicable, carefully and using only hand tools (no power tools shall be used unless specifically requested by Contracting Authority's architect and civil engineer in charge), remove cement based renders applied to areas of the structure.

B.2.6 If applicable and using methods and materials approved by Contracting Authority's architect and civil engineer in charge, number existing stones as directed by architect and civil engineer in charge, and to specifications listed below. The numbering methodology to be employed shall be determined by the Contracting Authority's architect and civil engineer in charge. Copies of drawings and photographic records shall be handed to architect and civil engineer in charge as part of the building file to be compiled by the contractor for this project as detailed in this document.

B.2.7 Carefully dismantle sections of outer leaf, taking care to adequately prop surrounding stone work. Extents of masonry work to be dismantled shall be determined by the architect and civil engineer in charge.

B.2.8 Carefully, taking care not to damage the stonework by chipping etc., store dismantled outer leaf on timber palettes. Care should be taken to ensure that dismantled stonework is not damaged and original patina of the stone shall be respected. Expanded polystyrene sheets or any other similar material approved by Contracting Authority's architect and civil engineer in charge shall be used to pack dismantled stone work on timber pallets for future use.

B.2.9 Carefully, remove unstable stone, material, etc., from areas of wall exposed following the dismantling of the outer skin of wall, store on site for future use, or load and cart away as directed by architect and civil engineer in charge, and prepare surface for the re-instatement of the previously removed outer leaf.

B.2.10 Re-instate dismantled stone in original place as previously numbered, substituting deteriorated stonework with new stone having similar dimensions and configuration. Form joints at back of stone-work to be re-instated, where and as directed by Contracting Authority's architect and civil engineer in charge, ready to receive chemical anchors/ ties. An average of two ties/anchors per metre run shall be introduced on every course, or as otherwise directed by the architect and civil engineer in charge.

B.2.11 Carefully, taking care to propagate the minimum vibration possible, drill holes in the masonry fabric ready to receive chemical ties/ anchors. Ties/ anchors shall be sunk to a minimum of 150 mm or as specified by the manufacturer into sound fabric. Grout ties/anchors using a suitable epoxy resin, or any other material as directed by Contracting Authority's architect and civil engineer in charge. When inserting ties/anchors, care should be taken to ensure that these are fixed at a suitable inclination as directed by Contracting Authority's architect and civil engineer in charge to ensure that newly re-instated stonework is well anchored to fabric of wall.

B.2.12 Tie stone blocks together by forming joints as detailed by architect and civil engineer in charge, and grout using a suitable hydraulic lime-based mix, or otherwise, as directed by Contracting Authority's architect and civil engineer in charge.

B.2.13 Grout, using a hydraulic lime-based grout, any interstices resulting between newly re-instated leaf, and original fabric of wall. Grouting shall be carried out at course height intervals.

B.2.14 If applicable and taking care not to damage the original fabric of the façade, dismantle masonry and chisel concrete accretions as directed and approved by the Contracting Authority's architect and civil engineer in charge.

B.2.15 Using a stiff bristle/nylon brush (no wire brushes or power tools shall be used unless specifically requested by Contracting Authority's architect and civil engineer in charge), carefully dry brush, one section at a time, dirt from stonework and lime renders to be retained, including mouldings, marble plaques, sculptural elements etc. Care should be taken to ensure that no damage is caused to friable, delaminated stonework. If so deemed necessary, such areas shall be pre-consolidated adopting procedures outlined hereunder.

B.2.16 Using a stiff bristle/nylon brush (no wire brushes or power tools shall be used unless specifically specified by the architect and civil engineer in charge), and clean soft water free from salts having a conductivity inferior to 60μS wet brush, one section at a time, dirt from façade stonework and lime renders to be retained, mouldings, marble plaques, sculptural elements etc. Care should be taken to ensure that no damage is caused to friable, delaminated stonework. If so deemed necessary, such areas shall be pre-consolidated adopting procedures outlined hereunder.

B.2.17 Carefully, apply biocides as specified in this document, and in concentrations suggested by manufacturer, to areas of façade, including mouldings, sculptural elements, etc. affected by biological growth. Treated areas shall be brushed with a suitable nylon brush after a period of seven (7) days, or as recommended by manufacturer, following the application of the biocide to remove the dead growth. Procedure shall be repeated to affected areas until biological growth has been removed. Where so deemed necessary, thick layers of biological growth shall be carefully removed using delicate manual methods and hand tools, primarily scalpels prior to the application of specified biocide.

B.2.18 Carefully, and using only delicate manual methods and appropriate hand tools, primarily scalpels, remove as much as is technically possible, layers of black crust (gypsum) from stone surfaces on façade, particularly mouldings, sculptural elements, aperture surrounds etc. where applicable. Care should be taken to ensure that no damage is caused to friable, delaminated stonework. If so deemed necessary, such areas shall be pre-consolidated adopting procedures outlined hereunder.

B.2.19 Using methods as directed by Contracting Authority's architect and civil engineer in charge carry out poulticing to areas of walls, including lime renders to be retained, mouldings, marble plaques, sculptural elements etc. still affected by black crust (gypsum) formation. Poulticing shall be applied to specifications listed in this document. The procedure shall be repeated for as many times as so deemed necessary until the black crust formation has been removed, and a satisfactory level of cleaning is obtained. For payment reasons, this exercise will be considered an intrinsic part of the poulticing exercise, and in no case will the contractor be allowed to make claims for extra costs in relation to workmanship, and/ or material.

B.2.20 Carefully and where applicable, using only delicate manual methods and appropriate hand tools, primarily micro scalpels, remove, where and as directed by the Contracting Authority's

architect and civil engineer in charge, layers of lime wash renders and water-based paints. Care should be taken to ensure that no damage is caused to friable, delaminated stonework. If so deemed necessary, such areas shall be pre-consolidated adopting procedures outlined hereunder.

B.2.21 Carefully and where applicable, using only delicate manual methods and appropriate hand tools, primarily micro scalpels, and where approved by the architect and civil engineer in charge a neutral paint remover as specified in this document, clean the masonry, including any mouldings, marble plaques, sculptural elements etc. Care should be taken to ensure that no damage is caused to friable, delaminated stonework. If so deemed necessary, such areas shall be pre-consolidated adopting procedures outlined hereunder.

B.2.22 From close, detailed analysis carried out during the progress of work, areas to be consolidated shall be identified, and tests carried out to identify and quantify the salts present in the building fabric. Where levels of salt are considered to exceed acceptable levels, poulticing of the stone shall be carried out to reduce the salt content of the fabric to acceptable levels ready to receive consolidant as directed by architect and civil engineer in charge. The poulticing procedure shall be repeated for as many times as so deemed necessary until level of salts within the structure is considered acceptable. For payment reasons, this exercise will be considered an intrinsic part of the poulticing exercise, and in no case will the contractor be allowed to make claims for extra costs in relation to workmanship, and/ or material.

B.2.23 Using appropriate consolidants as specified in this tender document consolidate sections of deteriorated masonry work certified to contain acceptable salts level, and situated away from any rising damp or source of continuous water absorption, to include mouldings, sculptural elements etc. Consolidants used shall be as specified in this document, and shall be applied in such a way as to guarantee an acceptable penetration, exceeding 30mm. The consolidant shall be applied generously and uniformly to the stone surface, until the stone surface is saturated. If so considered necessary, the architect and civil engineer in charge may request that this exercise be repeated for as many times as so deemed necessary. For payment reasons, this exercise will be considered as an intrinsic part of the consolidation exercise, and in no case will the contractor be allowed to make claims for extra costs in relation to workmanship, and/or material.

B.2.24 Using a fluid lime based mortar, suitably prepared to specifications listed in this document, inject in interstices previously consolidated. When injecting, care shall be taken to ensure pressure exerted on delaminated stone sections does not cause the shearing of the same material. In cases where the extent of delamination is such that the layers of stone have become detached, the space resulting between the layers shall be suitably cleaned prior to the application of the injection mortar. Cleaning shall be carried out by low pressure air, conveyed through pipes adequately sized to reach within the interstices, followed by the liberal application of an approved volatile solvent, such as acetone. Using suitable methods designed to ensure a deep penetration, apply the injection mortar within the interstices and cure for a minimum of thirty (30) days, ready to receive lime injection. In cases where the

detached material is of considerate dimension, carbon fibre rods, bridging the weaker layers with the stronger fabric, and grouted with the same fluid lime-based mortar shall be introduced. Glass reinforced polyester resin and/or carbon fibre rods shall be inserted such as to be least obtrusive.

B.2.25 Using epoxy resins as specified hereunder, having suitable characteristics and viscosity, inject, under pressure, cracked masonry sections previously consolidated. Epoxy injection will be resorted to only for areas where injected fluid lime mortar would be inadequate.

B.2.26 Using a lime-rich mortar as directed by Contracting Authority's architect and civil engineer in charge, and as detailed in this document, point all open joints on structure, particularly mouldings, marble plaques, sculptural elements etc. Deep crevices and joints shall be filled up in layers, permitting at least twenty-four hours between the applications of each layer. All pointing shall be left shy from the surface; however, all pointing shall be such as to inhibit any water used during the cleaning process from lodging into the structure.

B.2.27 Using clean, potable soft water free from salts having a conductivity inferior to 60µS, and an approved controlled nebulous pulsating water spray or micro-blasting system as specified in this tender document, and as approved by architect and civil engineer in charge, clean dirt from stone surfaces on structure, particularly mouldings, marble plaques, sculptural elements etc. or as directed by architect and civil engineer in charge. The aim of this exercise should be to remove the dirt (soot, etc) from the limestone etc. rather than alter the original patina of the stonework. Any remaining dirt should be removed using approved micro-blasting techniques.

B.2.28 Using methods and materials as specified in this document carry out plastic repair to sections of deteriorated/damaged masonry work on any part of the structure, including mouldings, marble plaques, sculptural elements etc. The material used for the plastic repair shall be as specified in this document.

B.2.29 Using methods and materials as specified in this document carry out plastic repair to fill any alveoli formed on any part of the masonry structure, including mouldings, marble plaques, sculptural elements etc. The material used for the plastic repair shall be as specified in this document, and care shall be taken to ensure that each alveolus is filled in individually, taking care to keep the surface of the masonry clean and free from any mortar. All plastic repair shall be formed such as to match adjoining stonework and previous plastic repair, in colour, texture and final profile. The extent of filling of the alveoli shall be determined on site by the Contracting Authority's architect and civil engineer in charge and shall vary to reflect the physiognomy of the deteriorated masonry fabric.

B.2.30 Using methods and materials as specified in this document and as directed by architect and civil engineer in charge, reinstate using plastic repair techniques, the deteriorated sections of old plastic repair previously carried out, on any area of the face of the wall, to include cornices, openings, merlons, etc. All plastic repair shall be formed such as to match adjoining stonework and previous plastic repair, in colour, texture and final profile. Rate is to include for the addition of any admixture, additive or fibre strands etc. specified in the tender document and/or recommended by architect and civil engineer in charge. Rate is to

include for the removal of loose, damaged or unsound areas of the original plastic repair as directed by Contracting Authority's architect and civil engineer in charge. The areas of the original repair removed, shall be kept to a strict minimum necessary to provide a sound base for the new plastic repair.

B.2.31 Replace any deteriorated masonry, including mouldings, sculptural elements etc. Carefully chisel away all deteriorated stonework to a depth as specified in this document or as directed by architect and civil engineer in charge, taking care, in the process, not to damage surrounding sound old stonework. All re-instated stone shall be of varying thickness and in no case less than 230mm in thickness or as directed by architect and civil engineer in charge, such as to ensure a good interlocking effect with the adjacent area of wall. All newly re-instated masonry shall be grouted to the original wall with an appropriate lime based grout. If requested, all newly re-instated masonry blocks shall be adequately hacked at the back and painted, at the back and sides, with a bituminous compound prior to grouting unless otherwise indicated by the Contracting Authority's architect and civil engineer in charge. All replaced stonework shall be similar in size and configuration to original, and shall match with the existing course heights. Most of replaced stonework will be special sized stone. Where applicable, all new stonework shall be worked to templates to match the original prepared as specified in this document, and all exposed surfaces shall be finished by traditional mason's hand tools. No machine finish will be allowed.

B.2.32 Using hand tools, carefully remove all pointing loosened during the cleaning process, and re-point, together with all joints left shy. All pointing shall be carried out as neat as possible. The width of the pointing, should, as far as possible, be kept to the minimum possible. All pointing shall be carried out flush with the surface of the masonry, directing water away from facade.

B.2.33 Using appropriate waterproofing materials as specified in this document protect horizontal surfaces of projecting elements to direct rain water away from the structure and minimize water penetration into the fabric.

B.2.34 If requested, adopt a system specified hereunder, to fix/install anti-roosting bird spikes to all projecting cornices and ledges.

B.2.35 Using appropriate waterproofing materials as specified in this document replace and reinstate any damaged areas of the existing waterproofing membrane.

B.2.36 Apply a transparent finishing coat (velatura) to restored masonry where indicated by the architect and civil engineer in charge. The main aim of the velatura shall primarily be that of giving a unified appearance to the restored fabric. The mix of the velatura shall be prepared to the approval of the architect and civil engineer in charge.

Works to apertures

B.2.48 Taking care not to cause damage to the existing structure, sand existing apertures, making good any damages (including parts of the timber) and treating any rusting ironmongery and grilles. Any broken glass is to be replaced.

B.2.49 In cases where the aperture has to be replaced, taking care not to cause damage to existing structure, remove existing aperture and cart away. Design and manufacture aperture (including shutters and louvers if applicable) to match the measurements taken. Sand the timber smooth, and clean the surface the woodwork shall be cleaned from dirt, grease, etc.

B.2.50 Paint all timber works with an oil-based paint system as directed and approved by the architect and civil engineer in charge. Cleaned timber shall be primed with an aluminium-based paint. The paint system shall also include the application of oil-based undercoats and topcoats.

B.2.51 Avoid any damage and touch up any areas which have been scratched etc. Any parts deemed to be unacceptable by the architect and civil engineer are to be replaced at the expense of the contractor.

C.20 Demolition/Dismantling Works

C.20.1 Extent of works

C.20.1.1 The building or part of a building to be demolished is that shown on the drawings and described in the Bill of Quantities.

C.20.1.2 All demolition works shall be carried out in strict accordance with the drawings and Bill of Quantities and as directed by the architect and civil engineer in charge.

C.20.2 Avoidance of nuisance

C.20.2.1 Pulling down is to be carried out in such a manner as to cause as little inconvenience as possible to the users, any adjoining owners or the public and the contractor will be held responsible for any claims which may arise from the disregard of this clause.

C.20.2.2 Debris is to be sprinkled with water to prevent dust arising and all proper screens and protection provided to the satisfaction of the architect and civil engineer.

C.20.3 Artificial and temporary lighting and power

C.20.3.1 The contractor is to provide all artificial and temporary lighting and power required for the proper execution of the works (including safety-lights on any hoardings or gantries projecting on to or over the public road and/or footpath) and is to pay all charges in connection therewith.

C.20.4 Water

C.20.4.1 The contractor is to pay all charges for water required for the works and supply all tanks, temporary service pipes, stopcocks, connections, etc., as required and clear away on completion.

C.20.5 Reinstate and make good

C.20.5.1 All pulling down as hereafter described is to be carried out without damage to the remaining parts of the structure or adjoining property and if such damage shall occur in the carrying out of the demolition the contractor shall reinstate and make good the same at his own expense.

C.20.5.2 All making out and making good is to be executed with materials and workmanship to match in every respect the surrounding work and is to be properly bonded thereto.

C.20.6 Public footways

C.20.6.1 The contractor shall be responsible for maintaining and upholding the public roadway and footpaths and shall be responsible for and make good any damage to same.

C.20.7 Insurance

C.20.7.1 The contractor shall insure and indemnify the client against all claims by third parties and for all injury to workmen or others.

C.20.8 Plant

C.20.8.1 The contractor is to provide all requisite plant, scaffolding, drawing-in ways, gangways, planks, gantries, tarpaulins, etc., for the proper protection and execution of the works.

C.20.9 Give all notices

C.20.9.1 The contractor shall conform to the provisions of any Acts of Parliament relating to the works and to Police Laws and regulations and he shall give all notices required by the said Acts, Laws and Regulations and pay all fees in respect thereof.

C.20.9.2 The contractor shall give all notices to statutory authorities and shall allow them facilities for removing any fixtures, fittings, or services which may belong to them.

C.20.10 Possession

C.20.10.1 As soon as possession of the site is given to the contractor he shall proceed with the demolition and complete same as soon as possible.

C.20.10.2 It is essential that the whole of this work be completed at the earliest possible moment.

C.20.11 Advertising

C.20.11.1 The contractor under no circumstances will be allowed to use the hoarding or any part of the building for advertising purposes, but he will be allowed to exhibit the usual name boards to the approval of the architect and civil engineer.

C.20.12 Shoring

C.20.12.1 The contractor shall provide, erect and maintain all necessary needles, dead and raking shores to the surrounding property to the entire satisfaction of the architect and civil engineer. The construction and efficiency of the shoring for the purpose for which it is erected shall be the entire responsibility of the contractor. Should any subsidence or any other damage occur due to the inefficiency of the shoring or any other support provided, the damage shall be made good by the contractor at his own expense.

C.20.12.2 The contractor shall alter, adapt and maintain all such temporary works as may be necessary from time to time and finally clear away and make good all disturbed, he will be held solely responsible for the safety of existing buildings and the sufficiency of all temporary work, and provide all necessary tarpaulins and other means of covering up for the protection of new and existing works against inclement weather and make good all damage done.

C.20.13 Hoardings

C.20.13.1 The contractor shall obtain the necessary consent, pay all licence fees for and provide and erect vertical close-boarded hoardings as indicated in B.2.01 to the whole of the street frontage 2.5m high with necessary returns at ends. Necessary access doors shall be provided

in the hoardings which shall be altered and adapted as may be necessary during the carrying out of the work.

C.20.14 Diversion of services

C.20.14.1 Before commencing the demolition of any part of the structure, all electrical, heating, sprinkler, sanitation and other services which come within the area to be demolished shall be disconnected or diverted so that they may be entirely self-contained with any portion of the premises which is to remain.

C.20.15 Demolition

C.20.15.1 Carefully pull down the whole of the structure as shown on the drawings and described in the Bill of Quantities down to the level indicated by the architect and civil engineer in charge and cart away all materials and rubbish whatsoever.

C.20.16 Enclosing adjacent buildings

C.20.16.1 Where floors of adjoining buildings are exposed to the outside air provide and erect 1m back from edge of floor temporary framed and close-boarded screens with access doors and fastenings. Adapt as necessary during the progress of the work, clear away when no longer required.

C.20.17 Materials arising from demolition

C.20.17.1 Serviceable materials arising from the demolition, such as timber beams, rolled steel joists, doors and windows etc., are to remain the property of the client and are to be cleaned and removed to a site/store as indicated by the architect and civil engineer.

C.20.17.2 The remainder of the materials arising from the demolition is to become the property of the contractor who is to cart it away from the site and the contractor is to make due allowance in his tender for the value of any sound materials so acquired or residual scrap value arising.

C.20.18 Making good

C.20.18.1 All making out and making good is to be executed with materials and workmanship to match in every respect the surrounding work and is to be properly bounded thereto, otherwise all new work is to be executed with materials and workmanship as hereafter described.

C.20.19 Re-use of old stone

C.20.19.1 Sound old stone arising from the pulling down may if cleaned, and approved by the architect and civil engineer be re-used in foundations and walls below ground level. No old stone may be reused for fair face work. Approved hard materials arising from the pulling down may be used in making up levels beneath floors, hard core beds, etc. All other materials not described to be re-fixed or stored and all rubbish and debris are to be basketed out if necessary and removed from the site.

C.20.20 Grub up old drains etc.

C.20.20.1 Grub up gulleys, break up manholes, etc., and fill in to voids with hard, dry stone as described and stop off all old disused drains at point of entry with cement concrete.

C.20.21 Work to expose old party walls

C.20.21.1 Where old party walls be exposed above level of roof or elsewhere by reason of new buildings, hack face and rake out joints and render and set in Portland cement and sand (1-3) trowelled smooth, and properly make good up to new and existing work (or alternatively, clean down face of stonework rake out joints and point in cement and sand (1-3) with a neat cut weathered joint), and generally make good all to the satisfaction of the architect and civil engineer and adjoining owners.

C.20.22 Labour

C.20.22.1 The workmen and supervision employed on demolition work must be experienced in this class of work.

C.20.23 Overloading of existing structures

C.20.23.1 Materials arising from the demolition must not be stacked or allowed to accumulate on existing structures in such a way as to endanger their stability. The contractor will be held entirely responsible for any damage arising from this cause.

C.20.23.2 Any sound old stone forming part of the building fabric, which needs to be temporarily removed to allow ease of work should be clearly marked and stored on site to be returned to its original place at the opportune time. Any unsound stone which need to be temporarily removed should be replaced by a new stone of similar dimensions and configuration. Soundness of stone is to be determined by architect and civil engineer in charge.

C.20.23.3 No separate payment shall be made for this work.

C.20.24 Disposal of resulting material

C.20.24.1 All materials which cannot be re-utilised for backfilling shall be hauled to spoil dumps outside the work area at any distance as approved by the architect and civil engineer in charge.

C.20.24.2 As a rule, unless otherwise specified, the depositing in spoil dumps shall be a minimum distance of 3 metres from the outside edge of any trench and 2m from any wall.

C.20.24.3 The materials shall, in any case, be disposed of in such a way as not to cause any disturbance to the flow of the water, and preferably into natural ground depression. The price for disposal of excavated material is deemed included in the priced bid.

C.30 Shoring/Scaffolding

C.30.1 Scaffolding

C.30.1.1 All work shall be carried out in accordance with local Occupational Health and Safety Regulations and the statutory MSA EN regulations (in particular MSA EN 39, MSA EN 74, MSA EN 1139, MSA EN 12810 and MSA EN 12811) and BS 2482.

C.30.1.1 Adequate precautions shall be taken to protect persons from injury by the fall of materials, tools or equipment being raised or lowered. Such precautions will include fencing, barriers and the like. Safety nets or sheets should be tied at every intersection of the scaffolding tubing and able to withstand rupture from the above mentioned loads; otherwise barriers (in the form of inclined overhangs) will be introduced at a distance of 4 to 6m above ground level followed by ones at 12m intervals. Fencing, barriers, or the appropriate utilization of lookout men.

C.30.1.3 The contractor shall provide competent supervision to ensure that all scaffolds are used appropriately, and only for the purpose for which they are designed or erected. It shall be erected and maintained in accordance with the local Occupational Health and Safety Regulations and certified by a competent and recognised person. No personnel are to be allowed on the scaffolding until such certification has been deemed compliant by the architect and civil engineer in charge.

C.30.1.4 Where work at the face of a building or other structure is done from a working platform, the space between such face and the working platform shall be as small as practicable, provided that, where workmen sit at the edge of the platform to work, such space may be up to a maximum of 300mm.

C.30.1.5 In transferring heavy loads on to a scaffold, a sudden shock not be transmitted to the scaffold. When hoisting loads on to scaffolds, the loads shall be controlled by a hand rope (tag line), so that they cannot strike against the scaffold. The load on the scaffold shall be evenly distributed, as far as practicable, and in any case shall be so distributed as to avoid disturbance of the stability of the scaffold. Scaffolds shall not be used for the storage of material except that required for immediate use.

C.30.1.6 Workers shall not be employed on external scaffolds in weather conditions that threaten their safety.

C.30.1.7 Guys, stays or supports shall be used where required to prevent danger; alternatively other effective precautions shall be taken to prevent the collapse of structures or parts of structures that are being erected, maintained, repaired, dismantled or demolished.

C.30.1.8 No scaffold shall be partly dismantled and left so that it is capable of being used, unless it continues to be safe for use.

C.30.1.9 Working platforms, gangways and stairways of the scaffolds shall be provided with overhead screens of adequate strength and dimensions to prevent danger from falling objects. Materials shall not be thrown from scaffolds; exceptions shall be made only where the landing

area has been designated, protected, appropriate notices displayed and are under supervision of a person at landing level.

C.30.1.10 Scaffolding materials shall not be thrown from scaffolds or from heights. Authorisation shall be sought before any other materials shall be thrown from scaffolds or heights and only where the landing area has been designated, protected, appropriate notices displayed and is under the supervision of a person on a landing level. In all circumstances, chutes shall be installed for the removal of materials from on the scaffolding.

C.30.1.11 Openings between the scaffolding and the structure, which exceed 20cm, should be adequately protected by the installation of handrails. Wherever the above hinders operations to be carried out, workers shall be provided with safety harnesses with independently secured lifelines.

C.30.1.12 Any timber used in the construction of scaffolds shall be straight-grained, sound and free from large knots, dry rot, worm holes and other defects likely to affect its strength. Where necessary, boards and planks used for scaffolds shall be protected against splitting. Ladders, boards and planks used in scaffolds shall not be painted, so that any defects remain visible. All tubes, couplers and fittings used in metal scaffolding shall be free from damage and distortion, and shall be maintained in a lubricated condition. Couplers shall not cause deformation in tubes. Couplers shall be made of drop forged steel or equivalent material. Tubes shall be cut cleanly square with the tube axis. Alloy and steel tubing shall not be intermixed on the same scaffold.

C.30.1.13 Tower scaffolds shall be designed and built in such a manner that the ratio of height to the base width is not more than 3.5:1, in the case of static towers used outdoors, and in a ratio of 4:1, in the case of static towers used indoors; in any case, the height of free-standing static towers should not exceed 12m. Mobile towers shall not be moved while persons or materials are on the top platform. The ratio of height to base width in the case of mobile towers used outdoors shall be of 3:1, but should not in any case exceed 9.6m in the case of free-standing mobile towers.

C.30.1.14 In the case of prefabricated scaffold systems, the manufacturers' instructions shall be strictly adhered to. Prefabricated scaffolds shall have adequate arrangements for fixing bracing. Frames of different types shall not be intermingled in a single scaffold.

C.30.1.15 In addition to the requirements for scaffolds in general as regards soundness, stability and protection against the risk of falls, suspended scaffolds shall have a safe cabin, with full protection from weather and adverse climatic conditions, and designed and constructed in accordance with ergonomic principles, a clear and unrestricted view of the area of operation; safe access to, and egress, from the cabin, including for situations where the operator is taken ill.

C.30.1.16 The scaffolding shall be tied to the building at suitable vertical and horizontal distances without causing irreversible damage/ alterations to the fabric of the building being restored. Preferably, scaffolding shall be secured by utilising existing openings/ holes. If not possible, a predetermined minimum number of perforations for tying the scaffolding to the historic

structures will be allowed. The latter will make use of a bolting system inserted in the joints between the blocks for minimum damage possible to the masonry.

C.30.1.17 Any scaffolding, when the work is divided in phases, shall overlap by at least 5m with the previously concluded phase of the works. In all cases the scaffolding shall extend by at least 1m beyond the extent of area being intervened upon or beyond the corner/s.

C.30.1.18 Prior to the dismantling of any scaffolding, the Contractor shall give the architect and civil engineer in charge sufficient time (at least 48 hours) to inspect the works.

C.30.2 Methodology: Lifting equipment

C.30.2.1 Any lifting gear or equipment intended for lifting shall not be loaded beyond its safe working load or loads as specified by the manufacturer. It shall be erected in accordance with the local Occupational Health and Safety Regulations and certified by a competent and recognised person. Regular inspections are to be carried out in accordance with the local regulations.

C.30.2.2 No person shall be raised, lowered or carried by a lifting appliance unless it is constructed, installed and used for that purpose.

C.30.2.3 Any lifting gear shall be erected and maintained in accordance with the local Occupational Health and Safety Regulations and certified by a competent and recognised person. No personnel are to be allowed on such gear until such certification has been deemed compliant by the architect and civil engineer in charge.

C.30.2.4 Every platform or receptacle used for hoisting any loose material shall be so enclosed as to prevent the fall of any of the material.

C.30.2.5 Any equipment with wheels, placed directly on a platform for raising or lowering, shall be so secured so that they cannot move, and the platform shall be enclosed as necessary to prevent the fall of the contents.

C.40 Cleaning Masonry

C.40.1 Extent of Works

C.40.1.1 Prior to the commencement of works, the building shall be inspected by the contractor together with the architect and civil engineer in charge to confirm the extent of work and the restoration methodology to be employed.

C.40.2 Materials: Water

C.40.2.1 The water to be used shall have conductivity inferior to 60µS/cm. The use of chlorinated water shall not be permitted. It shall comply with MSA EN 1008. It shall be pH neutral.

C.40.3 Materials: Paper pulp

C.40.3.1 The paper pulp used in the work shall be chemically stable, having a cellulose content of 99 +/- 1% and a calcium content of 0.025 +/- 0.005%. Average fibre diameter should be 20 microns, while the average fibre length shall be of 300 microns.

C.40.4 Materials: Sepiolite clay

C.40.4.1 The sepiolite clay used shall be natural having a water absorption superior to 148% and an apparent density of around 555g/l. The sepiolite clay used shall be asbestos free with a specific surface area of 218 to 222sq.m./g. The pH value shall be 8.0 +/- 0.5.

C.40.5 Materials: Biocide

C.40.5.1 The application of mild biocides that have a long-term inhibiting effect on re-colonisation shall follow the initial removal of organic growth.

C.40.5.2 Products to be used shall be neutral products belonging to the chemical class of compounds methoxy triazine, acting by being absorbed both through the roots and the leaves and have a wide spectrum of action; other products include quaternary-ammonium compounds, or as approved by the architect and civil engineer in charge.

C.40.6 Materials: Herbicide

C.40.6.1 The product to be used should result in the desiccation of the plant after it has been absorbed. The dead parts will then be easily removed by hand, without risking re-growth.

C.40.6.2 The following factors shall determine which chemicals will be used:

a) chemicals which do not cause damage to the stone;

b) chemicals which do not create any risk to man or other life forms, apart from the ones treated, taking into account their toxicity with respect to humans, earth fauna and sea fauna;

c) their activity period and residual effects;

d) do not contain harmful salts or other substance which can instigate or accelerate the deterioration of the stone.

C.40.7 Methodology: General

C.40.7.1 The contractor is to ensure that all the necessary measures are taken to ensure that masonry elements are not damaged, chipped, soiled stained or contaminated by salts and/or other deleterious substances during the works.

C.40.7.2 The contractor shall ensure that the stability of all of the structure is maintained throughout work. Any defects, including signs of movement that develop or become apparent during the course of works shall be immediately reported to the architect and civil engineer in charge.

C.40.7.3 The contractor shall protect works against damage by rain.

C.40.7.4 Necessary precautions shall be taken by the contractor to prevent the masonry bedding from drying out too rapidly in hot conditions and in drying winds.

C.40.7.5 All rejected work shall be removed and replaced using new materials at the contractor's expense. The contractor shall also be bound to replace any defective materials in all or parts of the existing works by proper materials and/or workmanship as directed by the architect and civil engineer in charge.

C.40.8 Methodology: Removal of vegetation

C.40.8.1 Every effort shall be made to remove all parts of plant including roots and stubs. Where growth cannot be removed completely without disturbing the masonry, the contractor shall seek instructions from the architect and civil engineer in charge.

C.40.8.2 Plants/weeds shall not be removed by cutting the plant at the base of the stem and then by the use of a biocide to kill off the remaining part of the plant unless explicitly told to do so by the architect and civil engineer in charge and if the contractor certifies that the herbicide/biocide being used is effective if applied in this manner.

C.40.8.3 The product to be used should result in the desiccation of the plant after it has been absorbed. The dead parts will then be easily removed by hand, without risking re-growth.

C.40.9 Methodology: Removal of higher forms of vegetation

C.40.9.1 The Contractor shall cut out a metre section of the main stem, around 300mm to 1m above ground level; care must be taken not to damage the adjacent masonry.

C.40.9.2 After the removal of almost all aerial parts of bushes and trees, chemical spot spraying shall be carried out on cut ends of stems and branches for perennial woody plants and on new buds and leaves in deciduous trees.

C.40.9.3 Systemic herbicides will be used with absorption through leaves or barks.

C.40.9.4 A procedure combining mechanical and cleaning means will follow to remove the plants completely.

C.40.10 Methodology: Removal of metal inserts etc.

C.40.10.1 The contractor shall ensure the careful removal of redundant cables and wires, light fixtures, and other accretions from the facades of the building. The methodology employed for this

removal shall be approved by the architect and civil engineer in charge prior to commencement of works.

C.40.10.2 Care shall be taken to remove all metallic inserts, (especially iron and steel fixings) from the stonework.

C.40.10.3 Corroding metal fixings shall be carefully cut by coring around them using small diameter bits so as to cause the least possible disturbance to the surrounding masonry. The associated rust debris shall also be carefully removed.

C.40.10.4 Resulting holes shall be filled-in using a suitable lime-based mortar when the break is small or by piecing-in stone, if the gap is large, as per specifications.

C.40.11 Methodology: Preservation of original masonry

C.40.11.1 The contractor shall ensure that original masonry work that shall be retained will be protected and left undisturbed during the course of works.

C.40.11.2 The contractor shall seek the approval of the architect and civil engineer in charge whenever existing masonry to be preserved will need to be cut or modified to accommodate new or re-used units.

C.40.11.3 The contractor shall ensure that structure to be retained is adequately propped to prevent damage caused by movement or any other means as a result of the works.

C.40.11.4 The contractor shall ensure that retained masonry in the vicinity of repair works is disturbed as little as possible.

C.40.12 Methodology for Cleaning: General Considerations

C.40.12.1 The cleaning methods adopted should, as far as possible:

a) Be effective in removing the deleterious substances from the stone surface;

b) Not produce any substances which will encourage any future deterioration of the stone;

c) Be slow enough such as to allow good control by the operator;

d) Must not cause any micro-fractures or any other discontinuities of the stone surface, as these may initiate or encourage new deterioration processes.

C.40.12.2 Abrasives, chemicals or high pressure water jetting will not be permitted. A controlled nebulous pulsating water spray system should preferably be used. The process must ensure that no over saturation and softening of the stone occurs. In those areas where this system is not sufficient to reach the required level of cleanliness, controlled micro-blasting on plain, non-decorative areas may be considered. Systems adopting sand, gravel, or water blasting techniques will not be considered.

C.40.12.3 Micro-blasting systems used shall be such as to function effectively at low pressure and use low quantities of water. The abrasive material used shall be calcium carbonate having size and configuration which will not damage the surface texture of the stone fabric.

C.40.12.4 It is important that any water used throughout the cleaning operation be free from salts. No chemical agents will be permitted. The use of tap water will NOT be permitted. The water to be used shall have conductivity inferior to 60µS.

C.40.12.5 The contractor shall test the pH value of clean water used for rinsing, the wetted surface and all chemical agents to be used in the cleaning processes before application.

C.40.12.6 All solutions shall be thoroughly mixed before taking a sample for pH measurement.

C.40.12.7 All readings shall be carried out at the same temperature, or compensated for if taken at different temperatures. All data shall be submitted in writing to the architect and civil engineer in charge.

C.40.12.8 The aim of the cleaning exercise should primarily be that of cleaning the face of the stone and removing all accumulation of carbon, sulphurous compounds, and other contaminants, but should retain the patina of time. On completion of works, the stone is to be brought to its natural patina, texture and profile. All discoloration is to be removed from the face of the stone. No original carved relief arises or surface textures are to be damaged or altered.

C.40.12.9 The contractor shall ensure that all electrical supplies serving external equipment have been disconnected and that, unless specified otherwise, fittings and associated cable have been removed.

C.40.12.10 The contractor shall take all measures to prevent:

a) Ingress of water, cleaning agents, debris and dust into the building via windows, doors, vents and other openings.

b) Protection of ventilation grilles, airbricks, or other ventilation openings without sealing them.

c) Damage to all components and finishes that can reasonably be protected during cleaning procedures, including lightning conductors, roof coverings, flashings, rainwater goods, glass, metal works, services equipment, signage and paving.

d) Staining of surfaces from ferrous or other reactive metals.

e) The contractor shall use approved protective boards, sheeting, films, sealants and sealing tapes that do not stain protected materials and that can be readily removed after cleaning without damaging or staining the protected material.

f) The contractor shall seek approval from the architect and civil engineer in charge should it be necessary to take additional measures for cleaning.

C.40.13 **Methodology for Cleaning: Tests to be conducted during the cleaning procedure**

C.40.13.1 The contractor shall be responsible to carry out tests as outlined with this document to determine the extent of salts within the masonry fabric. These tests shall be carried out prior and repeated during and after the cleaning process has been completed. The contractor shall furnish the architect and civil engineer in charge with the results of the tests.

C.40.13.2 Putty moulds of stone surfaces indicated by the architect and civil engineer in charge shall be prepared prior to the commencement of the cleaning works and repeated after final cleaning.

C.40.14 Methodology for Cleaning: Trial cleaning

C.40.14.1 The Contractor is to prepare trial samples for all cleaning methods in locations agreed with the architect and civil engineer in charge.

C.40.14.2 The Contractor shall inform the architect and civil engineer in charge before carrying out each trial cleaning method to enable the architect and civil engineer in charge to approve the

selected testing area and be present during the preparation and execution of trial samples. The period of notice shall be agreed with the architect and civil engineer in charge.

C.40.14.3 The time, date, location, details of all the products and procedures for each sample area shall be submitted in writing to the architect and civil engineer in charge.

C.40.14.4 The contractor shall provide the architect and civil engineer in charge with a copy of all the trial sample records.

C.40.15 Methodology for Cleaning: Monitoring

C.40.15.1 The contractor shall regularly monitor effects of each cleaning procedure against the degree of cleaning established by approved trail sample/s.

C.40.15.2 The contractor shall seek instructions immediately wherever:

a) Disruption to the surface occurs;

b) Discoloration or stains are revealed by cleaning;

c) Anticipated level of surface cleaning is not being achieved.

C.40.16 Methodology: Dry Brushing of surface

C.40.16.1 Prior to commencing any cleaning method, the contractor shall remove loosely adhered deposits and growths using suitable corrosion resistant brushes that do not damage the stone surface.

C.40.16.2 The use of brushes with steel bristles shall not be permitted. Nylon brushes will be preferred.

C.40.17 Methodology: Wet brushing of surface

C.40.17.1 General cleaning shall be carried out by means of low pressure washing (less than 2 bar) using water with a conductivity inferior to 60µS/cm and hand held mineral/nylon fibre brushes as directed and approved by the architect and civil engineer in charge. Garden type manual pump sprayers are to be used.

C.40.17.2 The spray shall be atomised from fine nozzles situation at least 300mm away from the masonry.

C.40.17.3 Stubborn deposits shall be removed first. Softened deposits shall be removed with suitable nylon brushes that do not damage the surface. Any debris shall be thoroughly rinsed.

C.40.17.4 The flows shall be directed from the top downwards so that the trickling of water softens the lower areas of dirt build-up.

C.40.17.5 In the process, care shall be taken to ensure no damage is caused to mortar joints and original plasters.

C.40.17.6 The water spray technique shall not be allowed in severely deteriorated areas.

C.40.18 Methodology: Water spray cleaning

C.40.18.1 Water spray cleaning with mounted nozzles shall be used in areas which require a prolonged period of wetting, as approved by the architect and civil engineer in charge. The wetting shall last for a period sufficient to produce the swelling of the layer of dirt, shall be used in

combination with small brushes to cut down the saturation period and shall be attached to a length of pipe connected to the approved water supply. Chlorinated mains water and water having a conductivity of more than 60µS/cm will not be allowed.

C.40.18.2 The spray shall be atomised from fine nozzles situated at least 300mm away from the masonry. Enough water pressure and small enough orifices shall be required to atomise the water.

C.40.18.3 The equipment shall be of a type which allows the position and direction of nozzles to be readily adjusted relative to existent surfaces and profiles.

C.40.18.4 For each surface, the nozzle positions and spraying cycles that enable deposits to be removed/softened whilst keeping the water running off the surface to a minimum shall be established.

C.40.18.5 The flows will be directed from the top downwards so that the trickling of water softens the lower areas of the dirt build up.

C.40.18.6 Regular monitoring and adjustment of the washing cycle and nozzle positions shall be ensured by the contractor as work proceeds. In addition, the water spray/mist shall be controlled by adequate sheeting which shall reduce the effect of draughts of air blowing away the water from the building, since the effectiveness depends on how successfully the mist can be contained.

C.40.18.7 The heaviest deposits shall be removed first. Softened deposits shall be removed with suitable nylon brushes that do not abrade the surfaces. Any debris shall be thoroughly rinsed.

C.40.18.8 The water spray technique shall not be allowed in severely damaged areas.

C.40.19 Methodology: Use of Mora Pack

C.40.19.1 The principle behind poultice treatment is that once soiling is dissolved, dirt is held in contact with the pack, rather than dissolved and permitted to fill the pores. The intimate and extended contact of the cleaning materials means that smaller quantities and lower concentrations of chemicals need be used.

C.40.19.2 Unless otherwise instructed by the architect and civil engineer in charge, ammonia shall be used in the poultice to soften the crust.

C.40.19.3 The AB57 (Mora Pack) with paper pulp/cellulose and/or sepiolite clay is to be used only where specifically requested.

C.40.19.4 The Mora Pack is a mild chemical pack containing agents which facilitate the dissolution of calcium salts. The poultice shall be prepared by mixing into a consistent sticky paste the following:

- 60g sodium bicarbonate;
- 60g ammonium bicarbonate;
- 25g ethylene diamine tetra acetic acid (EDTA);
- 10g surfactant disinfectant (neutral);
- 60g sepiolite clay/ paper pulp/carboxymethylcellulose (CMC);
- De-ionised/distilled water as required (tap water or water containing salts will not be permitted);

C.40.19.5 The above-mentioned ratios may be revised/adapted by the architect and civil engineer in charge as so deemed necessary. In such eventuality, the contractor may not demand any adjustment to the rates submitted for this tender document.

C.40.19.6 The mix is then suitably ironed to a thickness of 4 to 5mm on the pre-wetted soiled surface, and covered with a polyethylene film to prevent the poultice from drying up. The poultice is left in place for a contact period as considered necessary by the architect and civil engineer in charge, after which it is gently removed and the treated area rinsed with de-ionised water and brushed with a suitable nylon brush.

C.40.19.7 Given the nature of the crust, this process shall be repeated for as many times as so deemed necessary, until the black crust formation has been removed and a satisfactory level of cleaning is obtained. For payment reasons, this exercise will be considered as an intrinsic part of the poulticing exercise, and in no case will the contractor be allowed to make claims for extra costs in relation to workmanship and/ or material.

C.40.20 Methodology: Chemical cleaning for the removal of iron stains

C.40.20.1 the clay pack for iron stains shall consist of sepiolite clay and/or paper pulp added to a solution of glycerine, generally sodium citrate. The paste shall then be applied to the stain surface and left to dry.

C.40.20.2 The paste shall then be removed with wooden or other non-metallic spatula.

C.40.20.3 Several coatings might be necessary to lighten the stain. For stubborn stains, the surfaces shall be wetted. When lifted off, the surface is washed with copious amounts of water.

C.40.20.4 Given the nature of the stain, this process shall be repeated for as many times as so deemed necessary, until the stain has been removed, and a satisfactory level of cleaning is obtained. For payment reasons, this exercise will be considered as an intrinsic part of the poulticing exercise, and in no case will the contractor be allowed to make claims.

C.40.21 Methodology: Chemical cleaning for the removal of cuprous stains

C.40.21.1 The removal of cuprous stains shall be carried out by mixing one part of ammonium chloride with four parts powdered talc or sepiolite clay or paper pulp. A 10% solution of ammonia water shall be added to the mix.

C.40.21.2 The surfaces shall be wetted with clean water prior to the application of the paste and then be left to dry.

C.40.21.3 The paste shall then be removed with a wooden or other non-metallic spatula and shall then be rinsed thoroughly with clean water.

C.40.21.4 It may be necessary to reapply, remove and rinse off the paste to lift or satisfactorily lighten the stain, as instructed by the architect and civil engineer in charge.

C.40.21.5 Given the nature of the stain, this process shall be repeated for as many times as so deemed necessary, until the stain has been removed, and a satisfactory level of cleaning is obtained. For payment reasons, this exercise will be considered as an intrinsic part of the poulticing exercise, and in no case will the contractor be allowed to make claims.

C.40.22 Methodology: Chemical cleaning for the removal of graffiti/aerosol paint stains

C.40.22.1 A pasteous, solvent-free remover for mineral surfaces shall be applied in a thick layer left in contact with the paint for long enough to cause softening and to enable scraping and brushing to take place successfully. The layer shall be covered by a thin layer of plastic (as per manufacturer's recommended procedure).

C.40.22.2 Following this application, the surface shall then be washed thoroughly with warm water and neutral pH soap.

C.40.23.3 Given the nature of the stains, this process shall be repeated for as many times as so deemed necessary, until the stain has been removed, and a satisfactory level of cleaning is obtained. For payment reasons, this exercise will be considered as an intrinsic part of the poulticing exercise, and in no case will the contractor be allowed to make claims.

C.40.23 Methodology: Chemical cleaning using soap/detergents

C.40.23.1 The contractor shall apply a non-foaming pH neutral soap blend for water rinsing and completion of the cleaning.

C.40.23.2 The lowest possible concentration of agent and the shortest dwell times shall be established for all areas and surfaces.

C.40.23.3 The contractor shall keep written records of concentrations, dwell times, thickness and number of applications.

C.40.23.4 Powdered detergents shall not be used.

C.40.23.5 Given the nature of the stain, this process shall be repeated for as many times as so deemed necessary, until the stain has been removed, and a satisfactory level of cleaning is obtained. For payment reasons, this exercise will be considered an intrinsic part of the poulticing exercise, and in no case will the contractor be allowed to make claims.

C.40.24 Methodology: Chemical Cleaning by liquid gels

C.40.24.1 For each area/surface, the lowest possible concentration of agent/s and the shortest dwell times are established. The contractor is to keep written records of concentrations, dwell times, number of applications, ambient temperatures and rinsing water temperatures.

C.40.24.2 The contractor shall ensure that the chemical agents and rinsing water/sprays are contained within each treatment area and agents or rinsing water/sprays do not come in contact with surfaces that are either excluded from the cleaning or that have already been cleaned. It is important to prevent wind drift.

C.40.24.3 Before each application of agent, the surface and adjacent areas are wetted using clean water applied by a low-pressure spray. The wet surface is also tested for pH. The cleaning agent is then applied evenly over the surface and is not allowed to dry out.

C.40.24.4 The treated surfaces are then rinsed thoroughly and evenly with clean water working from the top of each area downwards. Water spray pressures that will drive the cleaning agent into, or cause disruption of the surface material and joints will not be used.

C.40.24.5 pH testing and neutralisation procedures will then follow.

C.40.25 Methodology: Use of surgical knives

C.40.25.1 Prior to commencing any cleaning method, the contractor shall remove loosely adhered deposits and growths using suitable corrosion resistant brushes and then use surgical knives should any dirt remain.

C.40.25.2 Surgical knives are to be such and are to be used in a way as not to cause scratches or damage the stone surface. They are to be used where indicated by the architect and civil engineer in charge.

C.40.26 Methodology: Micro-blasting

C.40.26.1 Low pressure micro blasting cleaning is to be used where explicitly indicated by the architect and civil engineer in charge with pressures not exceeding 3 bar. Any water used shall be free of salts and having a conductivity not exceeding 60µS/cm.

C.40.26.2 High pressure blasting or washing using pressures in excess of 3 Bar will not be allowed.

C.40.26.3 The contractor shall ensure that any water resulting from this cleaning process is not allowed to flow in the streets.

C.40.26.4 The contractor shall take all the masonry measures to ensure that any cleaning agent or residues are not allowed to stray onto adjacent or protected surfaces.

C.40.26.5 The contractor shall ensure that the grit used in the cleaning process is weaker than the stone being cleaning. No cleaning shall commence prior to the approval of the architect and civil engineer in charge.

C.40.26.6 The contractor shall clean, collect and safely dispose of all debris from scaffolding, ledges, etc at the end of each day.

C.40.26.7 The contractor shall prevent the marking of cleaned areas from dirt and debris splashing up from scaffold boards.

C.40.26.8 All cleaning shall commence at the uppermost section of the structure to avoid washing dirt onto previously cleaned surfaces.

C.40.26.9 Approved cleaning procedures or materials shall not be modified without the approval of the architect and civil engineer in charge.

C.40.26.10 The contractor shall seek approval from the architect and civil engineer in charge should it be necessary to take additional measures for cleaning.

C.40.27 Methodology: Application of biocide

C.40.27.1 Surface soiling by organic growth shall be initially removed by simple dry bristle brushes, surgical knife blades and spatulas, provided that the substrate is sound enough, without damaging or abrading the surface and as approved by the architect and civil engineer in charge. If the surface below the growth is delicate or liable to be marked or scoured in any way, this preparation will be limited/modified as approved by the architect and civil engineer in charge.

C.40.27.2 The biocides shall be applied in strict accordance with the manufacturer's recommendations for the safety and protection of the workers and the environment.

C.40.27.3 The general removal of organic growth such as fungi, lichens and the like will be limited to places where these are possibly causing harm and as indicated by the architect and civil engineer in charge.

C.40.27.4 In an exceptionally dry period, and in areas where it is recommended to remove the organic growth, dormant dry lichens shall be revived with light water spraying prior to the application of the biocide. Application of biocidal treatments will not be undertaken during wet weather or when windy conditions lead to the excessive drift of spray.

C.40.27.5 The contractor shall protect all surfaces that are excluded from chemical cleaning. All chemical agents shall be contained within each treatment area.

C.40.27.6 Process shall be repeated until the growth has been removed or until instructed to stop by the architect and civil engineer in charge. For payment reasons, repeated applications to achieve this will be considered an intrinsic part of the exercise, and in no case will the contractor be allowed to make claims.

C.40.28 Methodology: Completion of works

C.40.28.1 No part of the scaffolding shall be dismantled prior to the approval of the architect and civil engineer in charge. The contractor shall give the architect and civil engineer in charge at least one week notice to allow for a final inspection and the measurement of works.

C.40.28.2 The contractor shall be responsible for the cleaning of all apertures, glazing, ledges, window sills etc from any material resulting from any of the processes outlined in this document.

C.40.28.3 The contractor shall ensure that all gutters, down pipes, gullies etc are clean and in a condition to function effectively.

C.41 Repairing/Renovating/Conserving Masonry

C.41.1 Extent of Works

C.41.1.1 Prior to the commencement of works, the building shall be inspected by the contractor together with the architect and civil engineer in charge to confirm the extent of work and the restoration methodology to be employed.

C.41.2 Materials: Water

C.41.2.1 The water to be used shall have conductivity inferior to 60µS/cm. The use of chlorinated water shall not be permitted. It shall comply with MSA EN 1008. It shall be pH neutral.

C.41.3 Materials: Consolidants

C.41.3.1 Stone consolidants are applied to the stone fabric as liquids, depositing a solid material within the pore structure of the material.

C.41.3.2 The main function of a stone consolidant should be that of restoring the cohesion, physical properties and appearance of the deteriorated stone. It is thus important that the choice of a suitable consolidant should be based on the following parameters:

a) Consolidating value, whereby the treated deteriorated stone recovers its original properties, mainly strength, surface hardness and abrasion resistance;

b) Durability;

c) Depth of penetration, affected mainly by the viscosity and surface tension, rate of gel or precipitation formation, method and conditions of application, and rate of evaporation;

d) Stone porosity. As the proportion of fine pores increases, the stone becomes more susceptible to salt attack. The consolidant should, ideally not alter the pore size distribution of the original material;

e) Moisture transfer;

f) Compatibility. Treated stone should have three-dimensional properties similar to that of the original stone. Consolidants should not form by-products containing harmful salts that can cause further damage to the stone;

g) Appearance of the consolidated stone.

C.41.3.3 Ethyl silicate consolidants to be used shall be non-toxic and of a one component system, having a silicium organic compound base (70 to 80%). They shall be thin, and have a low viscosity of 3.3c ST at 25°C or better, certified to penetrate deep into fine capillaries. They shall not impair the breathability of the stone structure, be durable and resistant to local weather. The consolidant used shall be colourless, have a density in the region of 0.96 to 0.98 g/cm^3, or better, and cure without any salt formation and shall be catalysed by atmospheric humidity.

C.41.3.4 Ammonium oxalate consolidants to be used shall be ammonium oxalate monohydrate $(NH_4)2C_2O_4.H_2O$ 99% pure. It shall be mixed with deionised water in the ratio of 50g of

oxalate and 950ml of water. It shall be thin, and have a low viscosity, be certified to penetrate deep into fine capillaries, shall not impair the breathability of the stone structure and be durable and resistant to local weather. The consolidant used shall be colourless, cure without any salt formation and shall be catalysed by atmospheric humidity.

C.41.4 Materials: Quicklime (airlime)

C.41.4.1 Unslaked Lime (quicklime - gir mhux imtaffi) shall be prepared from suitable, good quality upper coralline limestone. The quicklime should preferably be prepared in a wood-fired kiln in a temperature not exceeding 900ºC. The stone matter should be suitably cooked to prevent under burning, over burning, or sintering of the stone, keeping the contents of any inert residue to the minimum as permitted by established International standards.

C.41.4.2 The quicklime shall be crushed to a fine powder, sieved, packed, and delivered to site in dry conditions, and soon after baking. When testing samples of lime using hydrochloric acid, the CO_2 content of lime supplied shall be in the region of 3%. All lime shall conform to the statutory EN regulations and in particular MSA EN 459.

C.41.5 Materials: Slaked lime

C.41.5.1 Quicklime (unslaked lime) shall be slaked soon after it has been produced.

C.41.5.2 The slaking shall be carried out in a container of suitable shape and material which will not permit the material to overheat during the slaking process.

C.41.5.3 Soon after slaking, the lime shall be sieved through a 5mm gauge sieve to remove any un-reactive material.

C.41.5.4 The slaked lime putty shall be allowed to mature under water for a minimum period of 4 weeks before being used.

C.41.5.5 The slaked putty shall then be mixed with the aggregate specified above in ratio of 1 part lime to 3 parts sand or as indicated by the architect and civil engineer in charge.

C.41.6 Materials: Natural hydraulic lime

C.41.6.1 The natural hydraulic lime should be natural, free from any additions such as Portland cement, etc. or any other material which contains any quantity of deleterious salts such as sulphates, chlorides, nitrates, etc.

C.41.6.2 It is to conform to MSA EN 459 Part 1: 2010 Building Limes Definitions, Specifications and Conformity Criteria.

C.41.6.3 Supplier is to submit technical literature indicating conformity with this standard.

C.41.6.4 Unless otherwise indicated, the hydraulic lime used shall have a stone colour, and shall be certified to have been produced at a temperature inferior to 1100oC. The free water content shall be less than 2% and it shall be ground to a fine powder such that more than 85% passes through a 90µm sieve and more than 98% passes a 200µm sieve as indicated in Table 18 of MSA EN 459 Part 1: 2010. Penetration shall be greater than 10mm but less than 50mm and the air content 5% as indicated in Table 18 of MSA EN 459 Part 1: 2010.

C.41.6.5 If feebly hydraulic lime NHL 2 is specified, then the compressive strength at 28 days shall be more than 2.0MPa but less than 7.0MPa as indicated in Table 17 of MSA EN 459 Part 1: 2010. The composition shall be such that the proportion of $Ca(OH)_2$ shall be greater than 35 while the SO_3 less than 2 (mass fraction in percent as indicated in Table 16 of MSA EN 459 Part 1: 2010).

C.41.6.6 If moderately hydraulic lime NHL 3.5 is specified, then the compressive strength at 28 days shall be more than 3.5MPa but less than 10.0MPa as indicated in Table 17 of MSA EN 459 Part 1: 2010. The composition shall be such that the proportion of $Ca(OH)_2$ shall be greater than 25 while the SO_3 less than 2 (mass fraction in percent as indicated in Table 16 of MSA EN 459 Part 1: 2010).

C.41.6.7 The initial setting time shall be more than 60 minutes. Final setting time is to be within 40 hours.

C.41.6.8 The composition shall be such that the proportion of CaO and MgO shall be over 45%, while SiO_2, Al_2O_3, and Fe_2O_3 shall amount to approximately 12%-30%.

C.41.6.9 Unless otherwise indicated, the hydraulic lime used shall have a stone colour, and shall be certified to have been produced at a temperature inferior to 1100°C. It shall be ground to a fine powder such that more than 85% passes through a 90µm sieve and more than 98% through a 0.2mm sieve.

C.41.7 Materials: Sand for lime mortars

C.41.7.1 Fine aggregate (sand) for mortars shall be crushed Lower Coralline Limestone. It shall be clean, sharp and gritted and free from loamy matter and other deleterious substance. The sand is to be washed and screened when so directed by the architect and civil engineer in charge at the expense of the contractor.

C.41.7.2 It is to comply with MSA EN 13139 Grade 0/2 or 0/4 (as specified) Category 1 (less than 3% to pass the 0.063µm sieve) for repair and grouting mortars and Grade 0/2 or 0/4 (as specified) Category 2 (less than 5% to pass the 0.063µm sieve) for plasters.

C.41.7.3 Fine aggregate (sand) is to be well graded and conforming to the methods of sampling and testing and quality requirements of statutory EN regulations and in particular MSA EN 932 and MSA EN 933, unless specified otherwise.

C.41.8 Materials: Repair and pointing mortar

C.41.8.1 Portland cement mixes will not be permitted, unless otherwise instructed by the architect and civil engineer in charge.

C.41.8.2 All mixes shall be lime-based (the air or hydraulic lime being in conformity with these specifications) and compatible with the stonework in colour, strength and permeability. They will also be as close as possible in colour, composition and properties to the original mortars.

C.41.8.3 Lime mortars shall be free from cement and produced in conformity to standards set out in the statutory EN regulation and in particular MSA EN 998 and MSA EN 1015. Natural hydraulic lime mortars shall be in conformity with the relative section of these specifications.

C.41.8.4 The density of the lime putty shall range between 1.3 and 1.4kg/l and shall not contain any salts (nitrates, chlorides, sulphates, etc) which contribute towards the deterioration of the stone.

C.41.8.5 Pozzolanic or similar additives shall be preferred alternatives to give strength and durability to a lime-based mix, unless instructed otherwise. Any pozzolanic additive shall be added to the mortar just before use.

C.41.8.6 The properties of the mix shall be improved if hydraulic lime is used instead of both hydrated lime and pozzolana. In such cases, only aggregate shall be added. No cement or other pozzolanic additives shall be necessary, although additives to match the colour may be required as instructed by the architect and civil engineer in charge.

C.41.8.7 Unless otherwise instructed the mix shall be 1:3 binder aggregate by volume with water just enough to achieve workability.

C.41.8.8 The use of pozzolanic additives (such as brick dust, pozzolana etc.) to enable air limes to set hydraulically will be permitted. However care shall be taken to ensure that pozzolanic additives (natural or artificial) added are not toxic and do not contribute towards the deterioration of stone. The use of pozzolanic additives such as pulverised fuel ash or others which contain salts detrimental to the stone will not be allowed.

C.41.8.9 The permeability of the mortar mix/es might be compared with that of the stone before their approval for application on the monument. The permeability of the mortar will be compared with that of the stone by placing samples in a dish with a few millimetres of water to compare the rate of water uptake.

C.41.8.9 In all cases the minimum amount of water just enough to enable adequate workability shall be used in the mixes.

C.41.9 Materials: Lime injection grouts

C.41.9.1 The premixed injection mortars used shall be suitably prepared from good quality and chemically stable hydraulic lime, free from salts, pozzolana and other inert additives, mixed into a consistent thixotropic, injectable putty.

C.41.9.2 The injection grout should be free from any additions such as Portland cement, etc. or any other material which contains any quantity of deleterious salts such as sulphates, chlorides, nitrates, etc.

C.41.9.3 Unless otherwise indicated, the injection grout used shall have a stone colour, and shall be certified to have been produced at a temperature inferior to 1100ºC.

C.41.9.4 Mortar shall be injectable into the crevices using suitably sized syringes. Unless otherwise indicated, the hydraulic lime used shall have a stone colour, and shall be certified to have been produced at a temperature inferior to 1100ºC. The free water content shall be less than 2% and it shall be ground to a fine powder such that more than 85% passes through a 90µm sieve and more than 98% passes a 200µm sieve as indicated in Table 18 of MSA EN 459 Part 1: 2010.

C.41.9.5 It is to conform to MSA EN 459 Part 1: 2010 Building Limes Definitions, Specifications and Conformity Criteria.

C.41.9.6 The compressive strength at 28 days shall be more than 5MPa but less than 15.0MPa when tested to MSA EN 1015 Part 11: 1999 Methods of test for mortar for masonry, Determination of flexural and compressive strength of hardened mortar.

C.41.9.7 The composition shall be such that the proportion of $Ca(OH)_2$ shall be greater than 15 while the SO_3 less than 2 (mass fraction in percent as indicated in Table 16 of MSA EN 459 Part 1: 2010).

C.41.9.8 The initial setting time shall be more than 60 minutes. Final setting time is to be within 15 hours.

C.41.9.9 Testing for their permeability might be carried out before their approval for application on the monument. The permeability of the grout will be compared with that of the stone by placing samples in a dish with a few millimetres of water to compare the rate of water uptake.

C.41.10 Materials: Epoxy resin injection grouts

C.41.10.1 The epoxy resin used shall be a solvent-free resin-based product supplied in two packs (resin and hardener), having a low viscosity, and certified by manufacturer to suitably fill cracks in the region of 1mm.

C.41.10.2 The resin shall be certified by manufacturer to have a suitable bonding to masonry, be colourless (or have a stone colour), be resistant to chemicals, and have an effective adhesion even on moist masonry surfaces.

C.41.10.3 The material shall be easily injected into the crack structure using proprietary methods and tools, including suitably sized non-return injection valves. It shall have a compressive strength greater than 60N/mm2 and a flexural tensile strength of more than 30N/mm2.

C.41.11 Materials: Filling mortar (grout) for large voids

C.41.11.1 Portland cement mixes will not be permitted, unless otherwise instructed by the architect and civil engineer in charge.

C.41.11.2 All mixes shall be lime-based (the air or hydraulic lime being in conformity with these specifications) and compatible with the stonework in colour, strength and permeability. They will also be as close as possible in colour, composition and properties to the original mortars.

C.41.11.3 Lime mortars shall be free from cement and produced in conformity to standards set out in the statutory EN regulation and in particular EN 998 and EN 1015. Natural hydraulic lime mortars shall be in conformity with the relative section of these specifications.

C.41.11.4 The density of the lime putty shall range between 1.3 and 1.4kg/l and shall not contain any salts (nitrates, chlorides, sulphates, etc) which contribute towards the deterioration of the stone.

C.41.11.5 Pozzolanic or similar additives shall be preferred alternatives to give strength and durability to a lime-based mix, unless instructed otherwise.

C.41.11.6 The properties of the mix shall be improved if hydraulic lime is used instead of both hydrated lime and pozzolana. In such cases, only aggregate shall be added. No cement or other pozzolanic additives shall be necessary.

C.41.11.7 Unless otherwise instructed the mix shall be 1:3 binder to aggregate by volume with water just enough to achieve workability.

C.41.11.8 Unless otherwise indicated by the architect and civil engineer in charge, the use of larger size stone spalls is acceptable in voids in which the smallest dimension exceeds 150mm. The proposed mix is to remain be approved by the architect and civil engineer in charge.

C.41.11.9 The use of pozzolanic additives (such as brick dust, pozzolana etc.) to enable air limes to set hydraulically will be permitted. However care shall be taken to ensure that pozzolanic additives (natural or artificial) added are not toxic and do not contribute towards the deterioration of stone. The use of pozzolanic additives such as pulverised fuel ash or others which contain salts detrimental to the stone will not be allowed.

C.41.11.10 Any pozzolanic additive shall be added to the mortar just before use.

C.41.12 Materials: Globigerina Limestone

C.41.12.1 Unless otherwise specified by the architect and civil engineer in charge, limestone used in the works shall be of the globigerina limestone (franka) type supplied from an approved source. The Contractor shall submit the name, location and licence number of the supply quarry from where the stone is being cut. The quarry shall be approved by the architect and civil engineer in charge and cannot be changed without prior approval.

C.41.12.2 Unless otherwise indicated stone to match the existing will be requested. The new stone work shall be worked carefully, and true to shape (ikkartabunat).

C.41.12.3 All stone blocks (unless otherwise requested) shall be cut as smooth as possible before delivery to site. All arises shall be true and all surfaces plane and truly perpendicular to each other sand to a finished uniform height. The stone blocks shall be delivered to site on pallets, clearly marked as to the type. All stone blocks shall be unloaded carefully to prevent damage and wastage.

C.41.12.4 Only best quality "franka" stone from approved sources, free from all defects, shall be used. The stone shall have good and consistent aesthetic qualities, good durability and uniformity in appearance. It shall not have excessive quantities of red stains or hard shell fragments, but shall be fine-grained and free from spits and clay material. Any stone showing ‘soll’ traces or blue markings (swaba) and/or any other defects on the exposed face, or whose edges or corners have been chipped, shall be rejected.

C.41.12.5 Should any such stones be used, the architect and civil engineer in charge shall have the power to remove and replace such work at the contractor's expense. The Contractor shall also be bound to replace any defective materials in all or parts of the existing works by proper materials and/or workmanship as directed by the architect and civil engineer in charge.

C.41.12.6 The limestone blocks shall be faced and trimmed in a way that no chipped edges are visible, unless the architect and civil engineer in charge has requested the use of recycled masonry originating from the original construction itself.

C.41.12.7 The blocks shall be transported to site on pallets and handled in such a way as to minimise damage and waste.

C.41.13 Materials: Lower Coralline Limestone

C.41.13.1 Unless otherwise specified by the architect and civil engineer in charge, any Lower Coralline limestone used shall be of first quality material without any blemishes and faults.

C.41.13.2 The colour of the limestone shall be uniform and shall be as free as possible from defects. The limestone is to be of a compact nature and shall be free from defects and large pores throughout. The properties of the material shall be as follows depending on the type requested:

	Mara Member	Xlendi Member	Attard Member
Colour	Pale cream	Pale cream to light rown	White
Water absorption at atmospheric pressure (Note 1) (%):	Max 6%	Max 6%	Max 6%
Apparent density (Note 2) (Kg/m3):	2200 -2500	2200-2500	2200-2500
Total porosity (Note 2) (%):	Max 30%	Max 20%	Max 20%
Uni-axial compressive Strength (Note 3) (MPa):	Min 20	Min 25	Min 25

Note 1: Testing in accordance with MSA EN 13755.

Note 2: Testing in accordance with MSA EN 1936.

Note 3: Testing in accordance with MSA EN 1926.

C.41.14 Materials: Fibre strands

C.41.14.1 Fibre strands used to reinforce mortars shall be polymer-based, certified by the manufacturer as suitable for the nature of the works described. They shall be such as to prevent shrinkage crack formation, withstand corrosion and be resistant to alkalis and acids.

C.41.14.2 Fibre diameter shall be in the range of 17 to 20 microns, and having a specific density ranging between 870 and 930kg/cu.m.

C.41.14.3 They shall have a tensile strength in the region of 390 to 500Mpa.

C.41.14.4 Max elongation at break point shall not exceed 14%.

C.41.14.5 When specified, a minimum of 0.85kg of these fibre strands or as recommended by manufacturer shall be mixed with one cu.m. of mortar mixed.

C.41.15 Materials: Stainless steel

C.14.15.1 All stainless steel used for this project shall, unless otherwise instructed by the architect and civil engineer in charge, be Grade 316 or better certified for use in marine environments as specified in EN 10088-1:2005 or its updated version.

C.41.16 Materials: Brick dust

C.41.16.1 Brick dust used shall be prepared from good quality red (terracotta) clay baked to a temperature between 850ºC and 900ºC. Clay baked at higher or lower temperatures shall not be used for the production of brick dust.

C.41.16.2 The brick dust used shall be clean and free from deleterious substances etc. The baked clay shall be crushed and adequately graded for use as specified in this document.

C.41.16.3 The use of glazed ware for the production of brick dust will not be permitted.

C.41.17 Materials: Anti-roosting bird spikes

C.41.17.1 Pigeon repelling systems adopted should be such as not to necessitate any irreversible intervention on the fabric of the building.

C.41.17.2 The dimensions of the system shall be suitable for the specific architectural elements, shall have an ultra-violet resistant polycarbonate base, and spikes fashioned from good quality stainless steel.

C.41.17.3 The system shall be resistant to UV (Ultra Violet) rays, salts, and the acidic nature of the pigeon droppings.

C.41.17.4 System shall preferably be fixed with a neutral silicone having suitable bonding properties.

C.41.17.5 Mechanical fixing shall be with suitably sized stainless steel screws and shall only be used to the approval of the architect and civil engineer in charge.

C.41.18 Materials: Liquid membrane

C.41.18.1 The liquid membrane shall consist of a thyrotrophic polymer based high resistance liquid, resistant to UV rays, to take foot traffic and with excellent adhesion to concrete and masonry surfaces.

C.41.18.2 The liquid membrane used shall be stone colour unless otherwise requested by the architect and civil engineer in charge.

C.41.18.3 Application shall comply strictly with manufacturer's instructions.

C.41.19 Methodology: General

C.41.19.1 The contractor is to ensure that all the necessary measures are taken to ensure that masonry elements are not damaged, chipped, soiled stained or contaminated by salts and/or other deleterious substances during the works.

C.41.19.2 The contractor shall ensure that the stability of all of the structure is maintained throughout work. Any defects, including signs of movement that develop or become apparent during the course of works shall be immediately reported to the architect and civil engineer in charge.

C.41.19.3 The contractor shall protect works against damage by rain.

C.41.19.4 Necessary precautions shall be taken by the contractor to prevent the masonry bedding from drying out too rapidly in hot conditions and in drying winds.

C.41.19.5 All rejected work shall be removed and replaced using new materials at the contractor's expense. The contractor shall also be bound to replace any defective materials in all or parts of the existing works by proper materials and/or workmanship as directed by the architect and civil engineer in charge.

C.41.20 Methodology: Opening of joints

C.41.20.1 The existing mortar shall be carefully removed without damaging the adjacent masonry or widening the joints using a bent spike or small hand-held chisels to a depth twice the width of the joint. Joints are to be opened to a minimum depth of 25mm and never to a depth less than their width.

C.41.20.2 Impact tools shall not be used. Power tools such as rotary discs (chasers) will not be allowed. No chipping hammers shall be used.

C.41.20.3 Care is to be taken to avoid damages to the adjacent stone surfaces. If the jointing material proves to be very hard to remove, then the contractor is to seek instructions from the architect and civil engineer in charge. Any change in the methodology employed shall be approved by the architect and civil engineer in charge.

C.41.20.4 If mortar has failed to such an extent that the joints are largely empty, then the joints will be deep tamped and, if necessary, hand grouted to fill the voids up to the distance required for pointing.

C.41.20.5 Power tools may not be used for the removal of renders, mortars and opening of joints unless explicitly requested by the architect and civil engineer in charge.

C.41.20.6 No filling/grouting/pointing shall be carried out before inspected by the architect and civil engineer in charge.

C.41.21 Methodology: Removal of plasters and cement renders

C.41.21.1 Where identified by the architect and civil engineer in charge, concrete/cement renders shall be carefully removed by hand tools using manual methods so as to contain damages to the underlying masonry work. Cement pointing and facing shall be removed manually taking care not damage the surrounding weakened stone. Chipping hammers shall not be used unless explicitly permitted by the architect and civil engineer in charge.

C.41.21.2 Old plasters and similar coatings should be removed by hand tools using manual methods and constant supervision so as not to damage the stone surface.

C.41.21.3 Electrical tools as well as tipped metallic instruments with sharp edges or corners, power tools (such as rotating disk cleaners) and sand blasting (dry or wet) shall not be permitted, unless instructed otherwise by the architect and civil engineer in charge.

C.41.22 Methodology: Removal of paints

C.41.22.1 Oil-based paints may be removed by a neutral paint-remover certified to contain no salts or any other deleterious agent. Repeated applications in paste form may be necessary to remove persistent stains.

C.41.22.2 Mechanical means, especially involving the use of power tools (such as rotating-disc cleaners and dry or wet sand-blasters) or tipped metallic tools will not be permitted unless instructed otherwise by the architect and civil engineer in charge.

C.41.23 Methodology: Preservation of original masonry

C.41.23.1 The contractor shall ensure that original masonry work that shall be retained will be protected and left undisturbed during the course of works.

C.41.23.2 The contractor shall seek the approval of the architect and civil engineer in charge whenever existing masonry to be preserved will need to be cut or modified to accommodate new or re-used units.

C.41.23.3 The contractor shall ensure that structure to be retained is adequately propped to prevent damage caused by movement or any other means as a result of the works.

C.41.23.4 The contractor shall ensure that retained masonry in the vicinity of repair works is disturbed as little as possible.

C.41.24 Methodology: Dismantling Work

C.41.24.1 Any dismantled masonry units shall be stored clear of the ground, separated by suitable spacers and in a way such as to protect edges and surfaces. All masonry units shall be cleaned from old mortar, soil etc and stored in a manner such as not to cause any damage.

C.41.24.2 The units shall be protected from adverse weather and stored in dry conditions.

C.41.24.3 The contractor shall ensure that the stability of the masonry structure is maintained throughout work.

C.41.24.4 Any defects, including signs of movement that develop or become apparent during the course of works, shall be immediately reported to the architect and civil engineer in charge.

C.41.24.5 All dismantling of masonry sections for subsequent reconstruction shall be carried out carefully by experienced personnel. Care shall be taken to ensure that during the dismantling procedure each stone block is numbered and referenced to a drawing, specified image, photograph etc. as directed by the architect and civil engineer in charge.

C.41.24.6 The masonry blocks/sections shall be removed in their entirety. Each unit shall be identified clearly and indelibly on concealed faces. The methodology to be employed shall be discussed with and approved by the architect and civil engineer in charge prior to the commencement of works.

C.41.25 Methodology: Reconstruction of previously dismantled structures

C.41.25.1 The architect and civil engineer in charge shall indicate and approve which of the original masonry units shall be replaced.

C.41.25.2 Reconstruction shall be carried out by experienced personnel who shall ensure that the original face and joint lines, joint widths etc. are respected to ensure that the final work

matches the original in all respects. Care shall be taken to ensure adequate bonding at junctions with the retained original structure.

C.41.25.3 The stone shall be cut and dressed so that the natural bed is horizontal in plain walling, vertical at right angles to wall face in projecting stones and copings, and at right angles to line of thrust in arches.

C.41.25.4 The bedding surfaces of the masonry blocks shall be dampened with de-ionised water having conductivity inferior to 60µS to control suction. The masonry blocks shall be laid on an evenly buttered bed of mortar prepared from a mixture of suitably slaked air line or hydraulic lime and stone dust. Care shall be taken to ensure that the exposed surfaces of the masonry blocks are kept clean.

C.41.26 Methodology: Determination of Salt Levels

C.41.26.1 Salt levels, as well as the types of salts shall be determined before, during and after treatment.

C.41.26.2 Samples shall be taken at depths of 0-25mm, 50-75mm and 75-100mm within the deteriorated zone as established by the architect and civil engineer in charge.

C.41.26.3 Surface salt levels shall be determined using stone dust scraped off the surface to determine its conductivity.

C.41.27 Methodology: Desalination by poulticing

C.41.27.1 Where salt desalinisation is considered necessary, paper pulp and/or sepiolite clay packs will need to be adopted.

C.41.27.2 Both clay and paper pulps should be free from soluble salts and any staining additive.

C.41.27.3 The poultice shall be worked with de-ionised/distilled water into a thick, sticky cream, and carefully ironed onto the surface with suitable spatulas, and permitted to dry slowly, attracting salts away from the stone fabric. Chlorinated mains water and water having a conductivity of more than 60µS/cm will not be allowed.

C.41.27.4 The dried material is to be disposed of away from the structure being restored and shall not be reused.

C.41.27.5 This process may have to be repeated for as many times as so deemed necessary, until the level of salts within the stone fabric has been brought down to an acceptable level. For payment reasons, this exercise will be considered as an intrinsic part of the poulticing exercise, and in no case will the contractor be allowed to make claims for extra costs in relation to workmanship and/or material.

C.41.28 Methodology: Consolidation using ethyl silicates

C.41.28.1 The consolidant shall be applied to the specifications detailed by the manufacturer. It shall not be applied to stone subjected to high moisture content or characterised by an elevated salt content. The surface to be consolidated is to be cleaned from loose dirt and dust by dry brushing. Ideally, the stone is to be consolidated by flooding either by a coarse-droplet, or preferably by a long-bristled brush.

C.41.28.2 The consolidant shall be applied generously and uniformly to the stone surface until the stone surface is saturated. If so considered necessary, the architect and civil engineer in charge may request that this exercise be repeated for as many times as deemed necessary. For payment reasons, this exercise will be considered as an intrinsic part of the consolidation exercise, and in no case will the contractor be allowed to make claims for extra costs in relation to workmanship and/ or material.

C.41.28.3 The consolidant shall not be applied in windy or elevated climatic temperature conditions which would impair the penetration of the same material. Consolidated areas should be protected from water, wind, and other natural/ man-invoked adverse conditions for a minimum of 30 days, or more if so specified by manufacturer.

C.41.29 Methodology: Consolidation using ammonium oxalates

C.41.29.1 The consolidant shall be applied to specifications detailed by the manufacturer, as well as adopting all the necessary safety provisions. The surface to be consolidated is to be cleaned from loose dirt and dust by dry brushing. It shall not be applied to stone subjected to high moisture content and shall be applied using a poultice. It is to be covered with cellophane for at least 24 hours.

C.41.29.2 The consolidant shall be applied generously and uniformly to the stone surface, until the stone surface is saturated. If so considered necessary, the architect and civil engineer in charge may request that this exercise be repeated for as many times as deemed necessary. For payment reasons, this exercise will be considered as an intrinsic part of the consolidation exercise, and in no case will the contractor be allowed to make claims for extra costs in relation to workmanship and/ or material.

C.41.29.3 The consolidant shall not be applied in windy or elevated climatic temperature conditions which would impair the penetration of the same material. Consolidated areas should be protected from water, wind, and other natural/ man-invoked adverse conditions for a minimum of period specified by manufacturer.

C.41.30 Methodology: Lime injection

C.41.30.1 Mortar injection of cracks shall be carried out with proprietary fluid lime based mortar as specified in this document.

C.41.30.2 Prior to injection, all stone surfaces should be desalinated, adequately consolidated, cleaned from any accumulated dirt/dust and suitably wetted with de-ionised water. Cracks shall be first flushed using alcohol.

C.41.30.3 Mortar shall be injected into the crevices using suitably sized syringes. Application should not be permitted in ambient temperatures exceeding 30oC.

C.41.30.4 When injecting, care shall be taken to ensure pressure exerted on delaminated stone sections does not cause the shearing of the same material.

C.41.30.5 In cases where the detached material is of considerate dimension, pins bridging the weaker layers with the stronger fabric, and grouted with the same fluid lime-based mortar shall be introduced. The stainless steel/carbon fibre/GRP rods shall be inserted such as to be least

obtrusive. The inner ends of the rods shall be fixed using either a lime based or an epoxy resin based mortar, as indicated by the architect and civil engineer in charge.

C.41.31 Methodology: Epoxy resin injection

C.41.31.1 Epoxy resins as specified in this document, having suitable characteristics and viscosity, shall be used for the injection, under pressure, of cracked masonry sections previously consolidated.

C.41.31.2 Epoxy injection will be resorted to only for areas where injected fluid lime mortar would be inadequate.

C.41.31.3 All masonry surfaces to be treated with epoxy resins shall be clean, free from any loose material, greasy substances, etc. Cracks should be superficially sealed and proprietary injection nozzles fixed.

C.41.31.4 Prior to injection, all stone surfaces should be desalinated, adequately consolidated, cleaned from any accumulated dirt/dust and suitably wetted with de-ionised water. Cracks shall be first flushed using alcohol.

C.41.31.5 No resin is to stain the adjacent stonework.

C.41.31.6 Following the injection of the epoxy resin, and after allowing sufficient time to ensure that the structural stability of the delaminated or otherwise masonry structure is restored, the masonry is carefully cleaned from the superficial mortar applied previously to seal cracks.

C.41.32 Methodology: Pinning of masonry

C.41.32.1 The contractor shall carefully drill holes in the fabric of the stone surface sloping downwards.

C.41.32.2 The holes shall be thoroughly cleaned to remove all drilling dust and debris and kept dry. The correct lengths of dowels shall be cut prior to the filling the holes with resin. The pins shall be cut to size prior to the injection of the resin and shall not be closer than 6mm to the surface for small diameters and 12mm for large diameters.

C.41.32.3 The holes shall be filled with sufficient resin so that, when the dowel is inserted, the resin is dispersed to achieve an effective bonding.

C.41.33.4 The ends of the ties and the resin shall be kept back from the face of masonry and exposed faces shall be kept clean and free from resin stains. Temporary plugging material and/or isolating membranes shall be used as necessary.

C.41.33 Methodology: Pointing

C.41.33.1 The work shall commence at the top of the wall moving downwards.

C.41.33.2 If joints exhibit biological soiling, a biocide should be applied prior to flushing out. Any vegetation shall be removed in accordance with these specifications.

C.41.34.3 The contractor shall clean the joints. Dust and loose debris shall be removed. The joints shall then be dampened with clean de-ionised water as necessary to control suction.

C.41.33.4 Lime mixes shall be used for the pointing. Mixes shall approximate a 1:3 binder to aggregate ratio, unless otherwise agreed with the architect and civil engineer in charge.

C.41.33.5 Ready-mixed lime mortar shall only be used if approved by the architect and civil engineer in charge.

C.41.33.6 All pointing shall be carried out in moist, warm conditions. The contractor shall ensure that all pointing is built up in layers not exceeding 10mm in thickness or as recommended by the manufacturer in cases were the use of ready-mixed lime mortars is permitted.

C.41.33.7 If mortar has failed to such an extent that the joints are largely empty, then the joints will be deep tamped and, if necessary, hand grouted to fill the voids up to the depth required for pointing.

C.41.33.8 The mortar shall be built up and firmly applied in layers until the specified thickness is reached. The contractor shall ensure good adhesion with no voids. A mechanical key shall be formed to the undercoat/s by combing or scratching so as to produce evenly spaced lines.

C.41.33.9 Each layer shall be allowed to achieve an initial set prior to the application of subsequent coats. The fresh mortar shall be kept as humid as long as possible to slow down the setting rate and hence avoid cracking.

C.41.33.10 After the initial set has taken place, the contractor shall stipple the joints with a stiff brush to remove laitance/excess fines and achieve a coarse texture.

C.41.33.11 It shall be prevented from drying out too rapidly by dampening intermittently with clean water and covered immediately with damp hessian and plastic sheeting.

C.41.33.12 The contractor shall provide adequate protection from adverse weather until the mortar repairs have fully set.

C.41.33.13 The required finish shall be as per original surviving pointing and as approved by the architect and civil engineer in charge.

C.41.33.14 If the stones have retained their sharp edges, the joints shall be filled flush unless the original joint face was profiled in some other way.

C.41.33.15 In the case of weathered edges, or where the stone has spalled off, the face of the new mortar shall be kept back such that the apparent joint width does not increase. The mortar face shall be kept as far back as required to achieve the original joint width.

C.41.34 Methodology: Removal of deteriorated stone

C.41.34.1 Every effort shall be made to retain as much as possible of the original masonry structure. To this effect no stone shall be replaced without the prior approval of the architect and civil engineer in charge.

C.41.34.2 Stone replacement will be limited to individual badly deteriorated stone blocks and the total area of stone replaced shall be kept to the minimum possible.

C.41.34.3 The masonry areas earmarked for replacement shall be clearly marked with a mason's pencil for the prior approval of the architect and civil engineer in charge. Marking by spray or other indelible markers prior to approval will not be permitted.

C.41.34.4 The contractor shall take measurements from existing masonry units, identified by the architect and civil engineer in charge, to allow replacements to be matched accurately.

C.41.34.5 Profile gauges shall ideally be used to record existing profiles with site. Alternatively the contractor may opt to record profiles on site by tracing the existing profile on cardboard or

any other suitable material. Where inserts are required to record profiles in-situ, but there are no suitable joints, the contractor shall seek instructions from the architect on the method to carry out such operation.

C.41.34.6 The contractor shall prepare accurate drawings and templates as necessary, clearly and indelibly marked to identify their use and location.

C.41.34.7 The methodology employed for the cutting away of the deteriorated masonry sections may vary depending on the particularities of every individual case. Nonetheless, care shall be taken to ensure that only hand held tools and small power tools (jiggers) which do not cause damage to the structure and/or immediate stone blocks will be used. The methodology employed shall be discussed with and approved by the architect and civil engineer in charge prior to the commencement of works.

C.41.34.8 The cutting of perimeter joints may be carried out with a masonry saw. If the stone is to be retained, the cut shall be made by a purpose-made fine saw blade or with a plugging chisel in the case of a wide joint. Where the stone is to be replaced, the stone shall be chiselled away starting from the centre and moving towards the edges.

C.41.35 Methodology: Preparation of replacement stone

C.41.35.1 Only new stonework, machine cut to a true shape (ikkartabunat) and hand finished shall be used unless otherwise directed by the architect and civil engineer in charge.

C.41.35.2 All new stone work used shall be similar in material colour, size and configuration to the original and shall match with the existing course height.

C.41.35.3 The architect and civil engineer in charge may request copies of templates produced by the contractor.

C.41.35.4 The stone shall be cut and dressed so that the natural bed is horizontal in plain walling, vertical at right angles to wall face in projecting stones and copings, and at right angles to line of thrust in arches.

C.41.35.5 Care shall be taken to ensure that new stonework is not chipped or otherwise damaged.

C.41.35.6 Each block/dressing is to be clearly marked on a concealed face to indicate the natural bed and its position in the finished work.

C.41.35.7 The contractor shall ensure to provide, erect and maintain for as long as necessary all struts, timber planks etc, required for the support of all new and old masonry.

C.41.35.8 The contractor shall be responsible to prepare all necessary formwork required for the replacement (in section or in whole), or the reconstruction, of arched elements such as arched windows, vaults, arches etc. The formwork shall be faithful to the original profile or that specified by the architect and civil engineer in charge.

C.41.35.9 All newly replaced stonework shall have a minimum bedding of 230mm unless otherwise specified by the architect and civil engineer in charge. The contractor shall ensure that suitable allowances are made for any final finishing carried out in-situ.

C.41.36 Methodology: Laying of replacement stone

C.41.36.1 Joint surfaces shall be dampened to control suction as necessary. When laying new stonework, all vertical and horizontal joints shall be adequately buttered with mortar. The units shall be laid on a full bed of mortar and all joints filled.

C.41.36.2 Care shall be taken to ensure that no mortar/grout encroaches upon the exposed faces.

C.41.36.3 The new stone shall be dampened to avoid risk of de-watering the mortar. Existing joint widths are to be maintained. Care should be taken to ensure that sinkings for fixings and joggles are accurately aligned and positioned in relation with the existing masonry.

C.41.36.4 Non-hydraulic mortar shall be used unless otherwise specified by the architect and civil engineer in charge. The mortar bed shall not be less than 12mm thick.

C.41.36.5 All faces, angles and features shall be carefully aligned and set out to ensure satisfactory joint widths and relative positioning with the existing masonry. The exposed faces of new material shall be kept to the face lines as agreed with the architect and civil engineer in charge.

C.41.36.6 Joints around replacement masonry units shall be thoroughly grouted wherever joints cannot be fully filled with bedding mortar. Grout mix shall be based on lime, fine coralline and globigerina limestone sand (xahx).

C.41.36.7 The grout shall be kept back from the exposed face to allow for the depth of pointing specified; this shall be achieved using an approved temporary sealing material. The contractor will ensure that the grout does not stain the exposed face.

C.41.36.8 The contractor shall not point replacement masonry until all the work has settled-in. The pointing of the outer 25mm (as a minimum) shall be left until all bedding work has settled.

C.41.36.9 The pointing of the top joint is to be carried out using a stiff mortar mix, deep tamped and cures so as to minimise shrinkage.

C.41.37 Methodology: Bonding dowels for replacement stone

C.41.37.1 Suitably sized holes shall be drilled in the background and rear of the replacement/insert to receive dowels and adhesive. The contractor shall ensure that the holes are aligned to allow accurate positioning of the replacement/insert and that enough depth is allowed for sound anchorage.

C.41.37.2 The holes shall be cleaned, all dust removed and adequately flushed with water. Adequate drying time shall be allowed. Smaller holes may also be cleaned by blowing out with a small tube.

C.41.37.3 The dowels shall be secured into clean, dry holes with adhesive. No adhesive shall be used to bond stones at joints unless agreed otherwise with architect and civil engineer.

C.41.37.4 The pins shall be cut to size prior to the injection of the resin and shall not be closer than 6mm to the surface for small diameters and 12mm for large diameters.

C.41.37.5 The resulting holes shall then be filled with matching mortar.

C.41.38 Methodology: Jointing of masonry works (piecing in)

C.41.38.1 Replacement stone shall be cut and shaped in such a manner as to ensure the minimum loss of the original material, yet provide a firm seating for the replacement.

C.41.38.2 The new stone work shall be left proud of the original to ensure adequate finishing on site.

C.41.38.3 All existing joint widths shall be respected and bridging of joints will not be permitted.

C.41.38.4 The pockets to receive inserts shall be accurately cut with small, sharp chisels and small saw blades to a neat, square profile. The sides of the pockets shall be undercut, where necessary, to provide space for specified bonding material.

C.41.38.5 Where so directed by the architect and civil engineer in charge, the contractor shall dove-tail the new insert with the original to ensure adequate bonding.

C.41.38.6 New shoulders shall be formed to receive any replacement cramps.

C.41.38.7 The pocket shall be cleaned out thoroughly and the inserts installed accurately and securely. The contractor shall ensure that no bonding material encroaches upon the exposed faces.

C.41.38.8 Piecing-in may also be carried out in larger areas, in which a piece of stone is added to fill in a missing area or replace a part of a deteriorated stone by the insertion of an appropriately cut stone piece, attached using structural adhesives (e.g. epoxy or polyester adhesives), as approved by the architect and civil engineer in charge.

C.41.39 Methodology: Grouting

C.41.39.1 The architect and civil engineer in charge may request grouting of voids resulting between new and old masonry, displaced masonry, etc with an inorganic material such as hydrated or hydraulic lime. The lime grout shall be prepared with or without filler depending on the size of the gap.

C.41.39.2 Glass reinforced polyester, epoxy or stainless steel ties shall be used as and where directed by the architect and civil engineer in charge.

C.41.39.3 Grouting holes shall be formed in joints at suitable horizontal and vertical centres to suit coursing and achieve an effective distribution of grout and fill all voids as per architect and civil engineer in charge's approval.

C.41.39.4 The maximum length of each lift between pours shall be established to prevent any disturbance of the masonry.

C.41.39.5 Unless re-pointing precedes grouting, the joint shall be sealed as necessary on either side of the grouting holes with an approved temporary material to prevent leaking of grout. The temporary seal shall be kept back from the face work to allow for specified re-pointing.

C.41.39.6 Before grouting, the delivery holes shall be thoroughly flushed with clean water.

C.41.39.7 Site trials, in all areas indicated by the architect and civil engineer in charge, shall be carried out for the different methods of grouting so as to establish the parameters required to achieve uniform grouting.

C.41.39.8 If done by hand, the grout material shall be poured under gravity into the interstices formed by the masonry structure.

C.41.39.9 If done by pumped gravity injection, then the delivery pressure shall be established after site trials

C.41.39.10 If done by gravity injection, then:

a) the approved equipment shall include a control of grout flow at the head of the hose (plug) and at the delivery nozzle (stop valve).

b) the height of the pan above delivery nozzle (subject to site trials) shall be sufficient to ensure an adequate flow, usually around 4.50m.

C.41.40 Inspection of masonry units

C.41.40.1 All completed units shall be carefully inspected and checked by the manufacturer/supplier against the approved sample/s and compliance with drawings and the specification before dispatching to site. The contractor shall inform the architect and civil engineer in charge at appropriate stages during production to allow inspection of masonry units prior to delivery on site.

C.41.41 Methodology: Plastic repairs

C.41.41.1 Plastic repairs as specified in this document shall be used in areas indicated by the architect and civil engineer in charge.

C.41.41.2 The work shall commence at the top of the wall moving downwards.

C.41.41.3 If the surfaces exhibit biological soiling, a biocide should be applied prior to flushing out. Any vegetation shall be removed in accordance with these specifications.

C.41.41.4 Any deteriorated, flaking, powdering etc masonry shall be carefully removed to expose a sound background. In the process care shall be taken not to weaken the structure or damage the adjacent masonry.

C.41.41.5 The top and vertical edges of the repair area shall be undercut to provide sufficient bonding and reduce the formation of visible shrinkage joints.

C.41.41.6 All mortar repairs shall be varied out in moist, warm conditions. The contractor shall ensure that all repairs are built up in layers not exceeding 10mm in thickness or as recommended in cases where the use of ready-mixed lime mortars is permitted.

C.41.41.7 Suitable non-ferrous reinforcement approved by the architect and civil engineer in charge shall be used for all plastic repair interventions which have a projection of more than 40mm from the stone surface or an area which exceeds 50mm by 50mm.

C.41.41.8 Pre-fabricated glass reinforced polyester or epoxy rods having a diameter of not less than 6mm shall be used. Holes shall be drilled with the background to form a grid of dowels fixed not more than 40mm apart. Dowels shall have a minimum anchorage in the stone of 60mm, and the architect and civil engineer in charge may request that this bedding depth be increased. All dowels shall be adequately bonded to the masonry fabric with an approved epoxy resin.

C.41.41.9 Adequately gauged stainless steel or nylon wire shall be used to form a mesh between the dowels. This mesh shall be secured to the resin dowels. This mesh shall be secured to the resin dowels by an approved epoxy resin.

C.41.41.10 When preparing the reinforcement, allowances shall be made to ensure a minimum cover of 20mm.

C.41.41.11 The plastic repair mortar shall be based on a lime binder with the addition of approved admixtures and micro fibre strands as specified in this document to enhance bonding and limit cracking.

C.41.41.12 Aggregates used shall vary from coralline sand, to marble and globigerina limestone sand (xahx) and to pozzolanic additives, as agreed with the architect and civil engineer in charge.

C.41.41.13 The mixes shall approximate a 1:3 binder to aggregate ratio, unless otherwise agreed with the architect and civil engineer in charge.

C.41.41.14 The contractor shall ensure that repair mortar is not stronger than the adjacent fabric.

C.41.41.15 In the mortar preparation, the contractor shall ensure that the grains of sand and stone dust are adequately coated with the binder paste.

C.41.41.16 Slaked lime may be used as a binder, with the putty mixed wet with the aggregate and stored in an airtight container as far in advance as possible.

C.41.41.17 In demanding exposure conditions, hydraulic additives (such as hydraulic lime, terracotta dust) may be added to the coarse stuff immediately before use.

C.41.41.18 Hydraulic lime may be used to substitute completely the slaked lime, as per architect's instructions.

C.41.41.19 Cement gauged mixes shall only be used if directed by the architect and civil engineer in charge.

C.41.41.20 The mortar shall be built up in layers where necessary, each layer not exceeding 12mm.

C.41.41.21 The contractor shall ensure good adhesion with no voids. A mechanical key shall be formed to the undercoat/s by combing or scratching so as to produce evenly spaced lines.

C.41.41.22 Each layer shall be allowed to achieve an initial set prior to the application of subsequent coats. The fresh mortar shall be kept as humid as long as possible to slow down the setting rate and hence avoid cracking.

C.41.41.23 After the initial set has taken place, the contractor shall stipple the joints with a stiff brush to remove laitance/excess fines and achieve a coarse texture.

C.41.41.24 It shall be prevented from drying out too rapidly by dampening intermittently with clean water and covering immediately with damp hessian and plastic sheeting.

C.41.41.25 The contractor shall provide adequate protection from adverse weather until the mortar repairs have fully set.

C.41.41.26 The required finish shall match the stone surface (in colour, texture, profile etc.) and as approved by the architect and civil engineer in charge.

C.41.42 Methodology: Repairs of concrete/cement renders

C.41.42.1 A modified polymer mortar shall be used to grout cracks and damages in concrete surfaces which shall be retained. The contractor is to submit proposed mortars for such repair works for approval by the architect and civil engineer in charge.

C.41.43 Methodology: Finishing (limewash)

C.41.43.1 Prior to the application of the limewash, the contractor shall wash the background to remove dust and grime, then allow it to dry to a damp state. Any organic growth shall be treated with a suitable biocide as directed by architect and civil engineer in charge and dead material brushed off before applying limewash.

C.41.43.2 Limewash shall be produced from mature lime putty mixed mixed with water to a suitable consistency. The contractor shall sieve the mix into a bucket, working through any lumps, but leaving any grit in the sieve. Colour is added as directed by the architect and civil engineer in charge, mixed in well and sieved again prior to use. As it is difficult to match lime colour batches, it is thus ideal that all lime wash provision required be prepared in one batch.

C.41.43.3 The contractor shall apply the limewash to the substrate with long-haired bristle brushes, using horizontal, vertical, and diagonal strokes, ensuring the lime wash is applied as thinly and evenly as possible and is burnished into the surface. Overly heavy coats will craze and crack when they harden and dry. If this occurs, the contractor is to wash off with hot water and a stiff bristle brush and ensure that the new covering is properly applied.

C.41.43.4 The contractor is to ensure even distribution of lime and pigment by constantly stirring the containers of limewash during application. He is to allow the first to dry fully before applying the second coat, and so on, lightly dampening the background before applying the next coat. Damping shall ideally be carried out by spraying water on an area of approximately 2sq.m. at a time. Protection from strong winds and direct sunlight during the drying out period shall be required.

C.41.44 Methodology: Completion of works

C.41.44.1 No part of the scaffolding shall be dismantled prior to the approval of the architect and civil engineer in charge. The contractor shall give the architect and civil engineer in charge at least one week notice to allow for a final inspection and the measurement of works.

C.41.44.2 The contractor shall be responsible for the cleaning of all apertures, glazing, ledges, window sills etc from any material resulting from any of the processes outlined in this document.

C.41.44.3 The contractor shall ensure that all gutters, down pipes, gullies etc are clean and in a condition to function effectively.

C.51 Restoring/Renovating/Conserving Timber

C.51.5 Restoration of Existing Joinery

C.51.5.1General

1. The main aim of this intervention shall be to preserve as much as possible of the existing joinery, and where these are extensively damaged to handcraft replacements which reflect the original design and workmanship of the existing joinery.

2. All work shall be carried out according to the best workmanship practices and in accordance with the latest local and EU-approved codes of practice.

C.51.5.2 Assessment of existing joinery

1. The assessment of the actual state of the joinery is a complex undertaking based on both subjective and objective decisions. The main aim of this assessment shall primarily be that of enabling the contractor, in agreement with the architect and civil engineer in charge to determine the best methodology to be employed to repair, wherever possible, and replace, in kind, where deterioration is such that maintenance as described in this document is not possible.

2. Assessment shall be carried out aperture by aperture and the contractor may be required to fill in a schedule for the approval of the architect and civil engineer in charge.

C.51.5.3 Inspection of paintwork

1. The paintwork shall be inspected to determine signs of deterioration in the form of cracking, peeling, blistering, etc. The inspection shall also determine the presence of any excessive build-up of paint layers and shall help the contractor, in agreement with the architect and civil engineer in charge to decide on the action to be followed.

C.51.5.4 Inspection of timber apertures

1. The timber apertures shall be inspected to determine operational soundness, dimensional changes due to seasonal temperature changes and water penetration, condition of joints, condition of ironmongery, soundness of timber, condition of glazing, and beading, etc. to help the contractor, in agreement with the architect and civil engineer in charge determine the course of action to be followed.

C.51.5.5 Other considerations

1. During the inspection procedure, the contractor shall examine the opening and ensure that the detailing of the masonry is such as to allow proper water runoff and no water is allowed to accumulate in contact with the timber apertures. Any poor design is to be brought to the attention of the architect and civil engineer in charge.

C.51.5.6 Paint removal – Health hazards

1. Old paints may contain lead or other harmful elements. To this effect care shall be taken to ensure that all personnel engaged in the cleaning of paint will wear the appropriate protective wear.

C.51.5.7 Paint removal – General

1. The contractor shall take all necessary precautions to ensure that the gentlest possible methodology for the removal of paint is employed. Particular care shall be taken to ensure that in the process no damage is caused to the timber fabric. Where technically possible care shall be taken to preserve as much as possible of the original paint layers.

C.51.5.8 Paint removal – Mechanical methods

1. Mechanical methods entailing the scraping or hand sanding of old paint layers shall be employed as specified and approved by the architect and civil engineer in charge.

2. All precautions shall be taken to ensure that no wood sections and/or surfaces are damaged in the process. All sanding shall be performed along the grain of the timber to avoid damage by going of the wood surface.

3. The timber surface may be prepared by sanding using sand paper of a suitable gauge. The sandpaper should be mounted on a off support such as timber be rubber blocks, to avoid formation of depressions of the wood surface.

4. Mechanical means other than rotary sanding equipment may be used for the cleaning of flat surfaces so approved by the architect and civil engineer in charge.

C.51.5.9 Paint removal – Pressurised jet

Cleaning systems employing the use of high-pressure water blasting will not be permitted.

C.51.5.10 Paint removal – Thermal methods

Thermal methods may be employed where complete paint removal is required provided

1. Adequate care is taken to ensure that the timber fabric is not charred or burnt.

2. Adequate care is taken to ensure that any glazing is not damaged.

C.51.5.11 Paint removal – Paint remover methods

The use of paint removers will be permitted for the softening of the paint provided

1. The paint stripper used does not damage the timber or alter the surface pose structures of the wood.

C.51.5.12 Paint removal – Sand blasting

Cleaning / removal of paint using wet and / or dry sand blasting techniques will not be permitted.

C.51.5.13 Preparations of timber elements

Care shall be taken to ensure that all timber elements are adequately dry and free from fungus or other parasites which contribute to wards the deterioration of the timber elements.

C.51.5.14 Joinery repairs

All effort shall be made to preserve as much as is technically possible of the original joinery work. Nonetheless extensively deteriorated timber sections shall be replaced. The replacements or new additions must retain character of the original joinery item.

When carrying out a replica of the original joinery replacement, the following criteria should be respected:

1. The size and characteristics of the opening leaves.
2. Proportions of the timber members used for the frame and leaf.
3. Configuration of the timber assembly.
4. Wood species.
5. Detailing and decorative features of the original joinery item.
6. Paint colour
7. Ironmongery

C.51.5.15 Surface finish

All timber work will be painted with an oil-based paint system as directed and approved by the architect and civil engineer in charge.

C.51.5.16 Nails and screws

The appearance of the nails and screws used in the repair of the joinery items is of great importance. To this effect where applicable all visible nails, screws etc used shall be hand-forged to match the originals in all respects.

C.51.5.17 Ironmongery

The contractor shall ensure that all effort is taken to preserve the original wrought ironmongery. The restoration of existing ironmongery shall be carried out as outlined in section 6 of this document.

C.51.20 Green Public Procurement Criteria – Exclusion of certain materials

C.51.20.1 Bidders must declare that the following materials/substances will not be used in the building:

- Products which contain sulphur hexafluoride (SF6).
- Indoor paints and varnishes[1] with a content of solvents (volatile organic compounds (VOCs) with a boiling point of 250°C maximum) higher than:
  - For wall paints (according to EN 13300): 30 g/l (minus water).
  - For other paints with a spreading rate of at least 15 m^2/l at a hiding power of 98% opacity: 250 g/l (minus water).
  - For all other products (including paints that are not wall paints and that have a spreading rate of less than 15m2/l, varnishes, wood stains, floor coatings and floor. paints, and related products): 180g/l (minus water).

C.51.20.2 Verification: Bidders must declare that these products/substances will not be used in the building.

[1] Limit values extracted from the European Ecolabel and relevant standards such as EN 13300.

F21 Natural Stone Walling

F.21.1 Extent of works

F.21.1.1 The work to be carried out by the mason comprises of the construction of single/double stone or hollow concrete block walls, pilasters, arches etc.

F.21.1.2 All masonry works shall be carried out in strict accordance with the drawings and Bill of Quantities and as directed by the architect and civil engineer in charge.

F.21.2 Materials: Stone masonry

F.21.2.1 The Contractor shall submit the name, location and licence number of the supply quarry from where the stone is being cut. The quarry shall be approved by the architect and civil engineer in charge and cannot be changed without prior approval.

F.21.2.2 All stone blocks (unless otherwise requested) shall be cut as smooth as possible before delivery to site. All arises shall be true and all surfaces plane and truly perpendicular to each other sand to a finished uniform height. The stone blocks shall be delivered to site on pallets, clearly marked as to the type. All stone blocks shall be unloaded carefully to prevent damage and wastage.

F.21.2.3 The finished size of stone blocks shall be in accordance with the Building Stone Order, Legal Notice of 1976.

F.21.2.2 Only best quality "franka" stone from approved sources, free from all defects, shall be used. The stone shall have good and consistent aesthetic qualities, good durability and uniformity in appearance. It shall not have excessive quantities of red stains or hard shell fragments, but shall be fine-grained and free from spits and clay material. Any stone showing ‘soll’ traces or blue markings (swaba) and/or any other defects on the exposed face, or whose edges or corners have been chipped, shall be rejected.

F.21.2.4 Should any such stones be used, the architect and civil engineer in charge shall have the power to remove and replace such work at the contractor's expense. The Contractor shall also be bound to replace any defective materials in all or parts of the existing works by proper materials and/or workmanship as directed by the architect and civil engineer in charge.

F.21.2.5 Each block shall be bedded in mortar as outlined below.

F.21.3 Materials: Mortars

F.21.3.1 The hydrated or hydraulic lime and soft stone fines shall be always used for stone masonry blocks. All mixes shall be further worked up with fresh water in small batches.

F.21.3.2 Mortar of at least Designation Mortar Class M2.5 shall be used for stone masonry.

F.21.3.3 A plasticizer (hydrated lime or soft stone fines) could be added to increase workability.

F.21.4 Materials: Aggregates

F.21.4.1 The aggregate size shall be not greater than 2 mm when the masonry mortar is sampled from a consignment in accordance with EN 1015-2 and tested in accordance with EN 1015-1. If required, the manufacturer shall declare the maximum grain size.

F.21.5 Materials: Premixed mortars

F.21.5.1 Premixed factory made masonry mortars (general purpose mortars, thin layer mortars, lightweight mortars) are to CE labelled in accordance with MSA EN 998-2 and provide the information listed in Table ZA.1 of the said standard.

F.21.6 Methodology: Walls

F.21.6.1 All walls required for the completion of this contract shall be built with masonry blocks unless otherwise indicated. They are to be truly perpendicular, laid in parallel courses and having vertical and horizontal joints not more than 10mm thick. Vertical joints are to be broken at not less than 150mm. Unless otherwise indicated, the course height (including the mortar) shall be 270mm.

F.21.6.2 Stone blocks shall be laid in a stretcher bond course pattern. All blocks shall be dressed to accurate plans and shall be neatly fine tooled on the face. The 'spika' and arisses shall be dressed square.

F.21.6.3 Unless otherwise indicated, courses shall be laid true to lines and levels and with corners straight and plumb. Jambs shall be square and plumb. In double wall construction they are to extend the whole width on an alternate manner.

F.21.6.4 'Fuq il-fil' courses shall be placed to form a consistent pattern with the perpends in strict alternative distributive vertical alignment including joints, curved and flat arches, jambs mouldings and ornaments.

F.21.6.5 Mechanical planers, bans and rotary saws are permitted but dust control measures are required and operators shall use protection for the nostrils and eyes.

F.21.6.6 Where applicable, double leaf walls are to be constructed with bond stones not less than 230mm thick and in every course a minimum of 2 metres apart from centre to centre and adequately damp proofed. The secondary walls are to be properly bonded to main walls by forming toothings in every alternate course of at least 100mm.

F.21.6.7 Quoins of all openings shall be protected. Stone lintels shall not be centrally located and a relieving voussoir shall be used above the lintol.

F.21.6.8 The stone in walling, copings, etc., shall be placed with the grain or natural bed horizontal and shall not be paid for extra unless otherwise specified. The beds and all faces of stone, including back of joints, are to be worked square and true from end to end. All joints shall be pointed and scraped to a smooth finish on completion.

F.21.6.9 Drip channels shall be formed under all protecting mouldings.

F.21.6.10 Outlet and inlet ventilators, of uniform section and with joints pointed and well flushed during laying, are to be formed wherever required by the architect and civil engineer in charge. These are to be clear of obstructions on completion of the buildings.

F.21.6.11 All stones and/or concrete blocks are to be well wetted before laying.

F.21.6.12 Dressing of stone is to be truly square. Moulded or ornamental work is to be of the best workmanship finish. If required, templates for all moulded work are to be prepared by the contractor and submitted for the approval of the architect and civil engineer. Before approving such templates, the architect and civil engineer may require the contractor to prepare and place on site

samples of the moulded work. Such samples are to be provided and paid for by the contractor.

F.21.6.13 All chases required for the fixing of woodwork, etc. are to be cut where and as directed.

F.21.7 Methodology: Mortars

F.21.7.1 Horizontal mortar joints shall be between 9mm to 13mm thick. Fresh mortar shall be distributed evenly over the whole bedding plane. Vertical joints shall be between 5mm and 8mm thick. The pointing of both the horizontal and vertical joints shall be flush.

F.21.8 Methodology: Damp proof course

F.21.8.1 Laying of vertical and horizontal damp proof courses is to be in accordance with the regulations laid down by the Sanitary Authorities. The horizontal damp proofing on walls is to be laid in layers as indicated by the architect and civil engineer in charge. Layers are to consist of a high-load damp proof course to BS 6398:1983 or equivalent.

J40 Flexible Sheet Waterproofing

J.40.1 Extent of works

J.40.1.1 All works shall be carried out in strict accordance with the drawings and Bill of Quantities and as directed by the architect and civil engineer in charge.

J.40.2 Material: Water Proofing Membrane

J.40.2.1 The bituminous membrane shall be of an approved quality, conforming in every respect to the required specification to meet favourably local climatic conditions, be long lasting without frequent need of maintenance, and to reach the scope of waterproofing. To this effect a 10 year guarantee period against the quality of the bituminous membrane and workmanship is to be undertaken.

J.40.2.2 The bituminous waterproofing membrane is to be of the torch welded type, laid on top of a well primed concrete deck or screed. The bituminous membrane shall have a reinforcing fabric to cater for longitudinal and transversal stresses accordingly. The membrane shall be of the type that will not break or crack when it is bent, or crack when bent or upturned, and to retain adhesion to the primed surface.

J.40.2.3 The surface finish must be totally resistant to ultra violet sun rays.

J.40.2.4 The bituminous membrane shall have the following characteristics:-

a) Softening and near running point of bitumen 140 deg. C.
b) Ultimate longitudinal elongation > 50%
c) Ultimate transversal elongation >50%
d) Ultimate resistance due to longitudinal stress > 80kg/5cm.
e) Ultimate resistance due to transversal stress > 60kg/5cm.
f) Reinforced with non woven polyester fabric.
g) Completely impermeable to water.
h) Minimum thickness 3.5mm, weight >4.0 kg/sq.m
j) A longitudinal strip of membrane free from removable finish of 10cm minimum width, is to be provided for overlapping purposes.

J.40.2.5 The type of bitumen offered in the membrane is to be a high quality modified residual petroleum distillation plant. The bitumen is to have additional plastomers, and other resin and polymers to increase flexibility where the chemistry characteristics of the material permit.

J.40.2.6 If requested, a sample of the type of membrane offered, should be submitted to the architect and civil engineer in charge for testing purposes. Samples supplied are to bear the name and address of the contractor and contract's reference.

J.40.2.7 The architect and civil engineer in charge shall have the power to reject any consignment or part thereof, should the material supplied fail to conform to the specification.

J.40.2.8 The bituminous membrane rolls are to be delivered and stacked in an up-right position without damage to the edges, which may occur mostly when unloading.

J.40.3 Methodology: Preparation

J.40.3.1 Where relevant, any existing waterproofing system is to be removed.

J.40.3.2 All services, joints, cracks, etc., in the roof slab are to be sealed with cement and sand mortar and thoroughly swept and washed clean.

J.40.4 Methodology: Triangular Fillets

J.40.4.1 Cement and sand triangular fillets are to be laid at all angles between horizontal and vertical surfaces.

J.40.5 Methodology: Concrete Screed

J.40.5.1 Where necessary, the surface of the roof shall be covered by the required thickness of concrete screed (Grade 15) necessary to eliminate any ponding and to ensure that the roof is sufficiently laid to falls. The surface of the screed shall be leveled, tamped smooth and laid to the appropriate falls as directed by the architect and civil engineer in charge.

J.40.6 Methodology: Roof Waterproofing

J.40.6.1 Waterproofing systems shall be of approved type and manufacture. It shall be laid or applied strictly in accordance with the manufacturers printed recommendations, a copy of which shall be supplied by the Contractor at the same time of tender. The country of origin and the name of the manufacturing company of the material are also to be stated. Systems employing the addition of water to the waterproofing material will not be permitted.

J.40.6.2 The waterproofing system shall be suitable for tropical conditions and shall be capable to withstand local weather conditions especially as regards to high temperature differences between day and night, high humidity and heavy rains.

J.40.6.3 The contractor is to submit a written undertaking at the time of tendering that he will guarantee the waterproofing qualities of his materials and workmanship for a period of 10 years from the date of completion, and that he will maintain the roof in a waterproof condition free of charge within this period, immediately he is notified of a defect. In default the Government reserves the right to order any necessary repairs at any price and from any source and charge the relative amount to the Contractor without the necessity of any legal proceedings.

J.40.6.4 All materials required for the waterproofing system shall be supplied by one manufacturer.

J.40.6.5 The waterproofing material shall be carried up parapet walls, abutments and vent or other pipes as high as the first course, 200mm minimum, or any other height which is additional to the flat roof surfacing. No right angled corners in the waterproofing will be accepted without the use of appropriate fillets.

Y.10 Documentation

Y.10.1 Methodology: Documentation (drawings)

Y.10.1.1 The contractor shall, on completion of works on each section, and prior to the certification of works, submit to the architect and civil engineer in charge a drawing accurately indicating all interventions carried out. This documentation shall form part of the building file to be submitted to the architect and civil engineer in charge on completion of works.

Y.10.1.2 A digital copy of the photogrammetric survey as per tender drawings will be provided by the architect and civil engineer in charge in AUTOCAD 2008 compatible versions as indicated in the bill of quantities.

Y.10.1.3 The contractor shall be responsible to map every intervention carried out so as to provide a detailed record of works for posterity. Distinct interventions (stone replacement, consolidation, desalination, etc) shall be mapped on a separate layer allowing the user to view each intervention separately. The mapping shall be carried on a stone-by-stone basis and the exact demarcation of each intervention shall be denoted by a closed polygon and hatched as detailed by the architect and civil engineer in charge.

Y.10.1.4 Prior to the certification of works the contractor shall submit to the architect civil engineer in charge two printed copies (in colour) in scale 1:100 or as requested by the architect and civil engineer in charge and a digital copy (AUTOCAD 2008 compatible). The drawings and mapping indicated shall be certified by a warranted architect and civil engineer as exactly representing the works (type and extent) carried out.

Y.10.2 Methodology: Documentation (photographic record)

Y.10.2.1 The contractor shall, on completion of works on each section, and prior to certification of works, submit to the architect and civil engineer in charge a set of photographs indicating all interventions carried out. This documentation shall form part of the building file to be submitted to the architect and civil engineer in charge on completion of works.

Y.10.2.2 The photographs shall clearly illustrate the interventions carried out as well as the state of the structures to be restored through this tender prior to the commencement of works. Any archaeological, historical or similar evidence such as masons marks, particular construction details, etc discovered on site during the progress of works shall also be documented.

Y.10.2.3 The photographs shall be submitted to the architect and civil engineer in charge prior to the certification of works. The photographs shall be submitted in digital format saved on a CD (Compact Disk) or DVD as directed and approved by the architect and civil engineer in charge.

Y.10.2.4 The photographs shall be taken with a high resolution colour digital camera, saved in .jpg format and not less than 3.2Mb in size.

Y.10.2.5 All photographs shall be taken with adequate lighting (flash light should as far as practicable be avoided) and should be of a good quality free from blurs and colour bleeding.

Z.10 Timber Works

Z.10.1 Extent of Works

Z.10.1.1 Prior to the commencement of works, the building shall be inspected by the contractor together with the architect and civil engineer in charge to confirm the extent of work and the methodology to be employed.

Z.10.2 Materials: Timber Generally

Z.10.2.1 Timber is to be straight, sound, bright, of matured growth, well conditioned, properly seasoned, clean sawn, square edged, free from rot, dote and incipient decay. Shakes, splits, warp, wanes, large, loose or dead knots, soft spots, stained or bright sapwood and other defects and blemishes will not be allowed.

Z.10.3 Materials: Sizes and Allowances

Z.10.3.1 For joinery, other than that provided by the relevant strandard, an allowance from the sizes indicated not exceeding 3mm for softwood and hardwood will be permitted for each wrought surface, unless the dimensions are indicated as `finished sizes'.

Z.10.3.2 Any spacing, overall dimensions, etc. specified on the Bill of Quantities are only indicative and the Contractor is responsible for taking physical measurements on site prior to the start of manufacture of the doors or windows.

Z.10.3.3 The Contractor is responsible for taking all physical measurements to ensure that the work is carried out in the most workmanlike manner.

Z.10.4 Materials: Softwoods

Z.10.4.1 Softwood is to be the best quality available with due regard to the particular purpose for which it is required. It is to be cut square and free from large loose or dead knots, shakes, or other defects, and is to be approved for use by the architect and civil engineer in charge. Softwood for joinery unless otherwise indicated is to be of the quality known locally as Red Deal. (Larix Decidua)

Z.10.5 Materials: Hardwoods

Z.10.5.1 Hardwood is to be of the best quality available with due regard to the particular purpose for which it is required, free from all defects and is to be approved for use

by the Engineer. All exposed surfaces are to be wrought and finished off by hand with glass paper.

Unless a particular hardwood is otherwise indicated any of those listed hereafter may be used according to the purpose for which it is required. The standard names quoted are those contained in MSA EN 13556.

NOTE:- Timbers marked * are for internal use only.

Purpose	**Standard name**	
Handrails, balusters,	European oak	Sapele*
and newels	Japanese oak	Red and white Seroya*
	African mahogany	Agba*
	Iroko	Keruing*
	Thitka	European beech*
		European birch*

NOTE:- Timbers marked * are for internal use only.

Exterior joinery	European oak	Gurjun
	Keruing	Teak
	Iroko	
Interior joinery	European oak	Red Meranti
	Japanese oak	Agba
	Teak	European beech
	African mahogany	Idigbo
	Thitka	

Other suitable hardwoods, may be offered by the Contractor; in which case details must be submitted with the tender. In addition to choosing the species of timber, the actual timber used is to be specially selected for grain, figure or other properties required.

Z.10.6 Methodology: Workmanship

Z.10.6.1 All work is to be executed in accordance with the schedules indicated in this tender document or any other details or schedules which may from time to time be given to the contractor. Joinery may be inspected in the Contractor's shops during preparation, and again before being primed if so required by the Engineer.

Z.10.6.2 All framed work is to be put together immediately as the general work is commenced, but not glued or wedged up until the joinery is prepared for fixing. All framing is to be put together with well fitted mortice and tenon joints.

Z.10.6.3 Running glued joints are to be cross-tongued and where the face of the joint is over 38mm thick they are to be double cross-tongued.

Z.10.6.4 All work is to be framed and jointed with an approved type of synthetic resin glue.

Z.10.6.5 All exposed surfaces are to be wrought machine sandpapered at works and the arrises blunted and all joinery not required to be painted, polished, or otherwise decorated is to be left clean on completion.

Z.10.6.6 All work delivered to site is to be stored immediately after delivery and protected from the weather.

Z.10.6.7 Where laminate is specified this shall mean the rigid sheet type. Thin factory applied type of finish will not be acceptable.

Z.10.7 Methodology: Defects

Z.10.7.1 Should any work shrink, warp, wind, expand or show other defects before the end of the maintenance period, the work is to be taken down and new work fixed in its place, together with any other work which may be affected. This is to be carried out at the Contractor's sole expense.

Z.10.8 Methodology: Fixing

Z.10.8.1 All work, so far as practicable, is to be securely fixed. Where the joiner's work is to be plugged, the plugs are to be hardwood cut on twist or approved proprietary brand plugs. When gluing, the adhesive is to be applied evenly over the entire surface of the facing boards and not on the core alone.

Z.10.9 Methodology: Stain/varnish/paint to woodwork

Z.10.9.1 Samples of stain/varnish/paint for testing may be taken by the Engineer from the sealed containers, spray gun containers or from the workmen's kettles on the works. Any work coated with unsatisfactory materials is to be cleaned off and re-executed. Likewise any work on which the stain/varnish/paint is found to be unduly thin is to be prepared again and re-applied all to the satisfaction of the architect and civil engineer in charge.

Z.10.9.2 Stains/paints are to be to the colours directed by the architect and civil engineer in charge. Where more than one coat is specified, each coat shall be in a different shade.

Z.10.9.3 All stain/varnish/paint paints are to be thoroughly mixed and stirred before use.

Z.10.9.4 The priming coat, undercoats and finishing coat of paint in any one paint system are all to be obtained from the same manufacturer. No paint is to be used beyond a period of 18 months from the date of manufacture or date of certificate of re-test. Woodwork shall be cleaned to remove dirt, grease, etc., before the primer is applied. Before applying the paint, all cracks, nail holes, open joints and other imperfections shall be made good with suitable filler, and knotting shall be applied to any knots. The primer shall be inspected to ascertain that it is of suitable type, firmly adhering, and in good condition before the appropriate finish is applied. If the primer is not satisfactory, the surfaces shall be completely stripped and treated again.

Z.10.9.5 Thinning of the paint will not be allowed without the permission of the architect and civil engineer in charge. If found necessary, this shall be carried out with the type of thinner and proportions recommended by the manufacturer of the paint.

Z.10.9.6 All woodwork shall be primed with a reputable brand of wood primer formulated to present an effective barrier to moisture penetration and a sound foundation for subsequent coats.

Z.10.9.7 Priming coats are to be adequate and uniform and are to be worked into the surface and into joints, angles and other places where moisture is likely to collect. The surfaces of all priming coats and undercoats are to be to properly rubbed down and dusted off between coats as required to provide a smooth matt opaque film to which the next coat will firmly adhere. Undercoats and finishing coats are to be applied to the surface so that every part, including joints, angles, etc., is adequately covered, but care is to be taken to avoid excessive or uneven thickness of paint film, particularly at edges and in angles etc.

Z.10.9.8 Paint is to be applied so that the surface of the finishing coat is free from brush marks including brush marks showing through from preceding coats

Z.10.9.9 One or more coats of undercoat are to be applied after priming and before the finishing coat to produce a smooth surface of even finish and similar colour to the finishing coat.

Z.10.9.10 Finish coat may have a matt, eggshell, semi or full gloss finish of selected colour as indicated by the architect and civil engineer in charge. Alkyd resin paints are to be used.

Z.10.9.11 Cellulose finishes, where indicated, shall be used with the correct primers, fillers and where appropriate the correct wood stain for the specific surface using an application procedure as laid down by the manufacturer.

Z.10.9.12 All woodwork shall be cleaned from dirt, grease, etc and sand-papered lightly before each coat.

Z.10.9.13 All stains and varnishes in any one system are all to be obtained from the same manufacturer. No product is to be used beyond a period of 18 months from the date of manufacture or date of certificate of re-test. Before applying each layer, all cracks, nail holes, open joints and other imperfections shall be made good with suitable filler, and knotting shall be applied to any knots. Each application shall be inspected to ascertain that it is of suitable type, firmly adhering, and in good condition before the appropriate finish is applied. If it is not satisfactory, the surfaces shall be completely stripped and treated again.

Z.10.9.14 The contractor shall take adequate precautions to prevent any defects arising out of the misapplication of the material used. This includes the supply and use of suitable brushes.

Z.10.9.15 All brushes, spraying equipment etc. used in carrying out the work are to be clean and free from foreign matter and are to be thoroughly cleaned out before being used for a different type or class of material. All products are to be prepared and applied strictly in accordance with the manufacturer's printed directions.

Z.10.9.16 All surfaces are to be thoroughly dry before the next coat is applied. No stain/varnish/paint is to be applied externally during inclement weather.

Z.10.9.17 Spray painting will be allowed with approved machines except where soiling of adjacent surfaces is likely to occur and in the case of paints containing lead. The compressor is to be of adequate capacity for the number of guns in use. The pressure at containers and nozzles, the size and type of nozzles and the adjustment and operation of the guns are to be such that the resultant coating is even, adequate (but not excessive) and of the correct composition throughout. Surfaces adjoining those being sprayed are to be carefully and closely masked and care is to be taken to avoid uneven or indeterminate boundaries through paint being forced under the masks. The finished surface is to be free from orange peel appearance, runs, sags, curtaining and other defects.

Z.10.10 Paints from one manufacturer

Z.10.10.1 The priming coat, undercoats and finishing coat of paint in any one system are all to be obtained from the same manufacturer. No paint is to be used beyond a period of 18 months from the date of manufacture or date of certificate of re-test.

Z.10.11 Methodology: Handling and Storage

Z.10.11.1 All units shall be individually wrapped or crated to avoid contact during transportation. All units shall be stored above ground in a dry area.

Z.10.12 Methodology: Installation

Z.10.12.1 Set units plumb, level and true to line, without wrap or rack of frame. Anchor frames solidly to surrounding construction to prevent distortion or misalignment. Apply protective coating on concealed surfaces in contact with a different type of material.

Z.11 Metal Works

Z.11.1 Extent of works

Z.11.1.1 Prior to the commencement of works, the building shall be inspected by the contractor together with the architect and civil engineer in charge to confirm the extent of work and the methodology to be employed.

Z.11.2 Materials: General

Z.11.2.1 Unless otherwise indicated, the metal to be used shall be grade 43 steel.

Z.11.2.3 All materials shall be the best of their respective kinds, free from defects, and to be obtained from approved manufacturers.

Z.11.2.4 All work shall be carried out in a workmanlike manner and strictly as directed by the architect and civil engineer.

Z.11.2.5 The materials, in all stages of transportation, handling and storage, shall be kept clean, free from injury and breaking, bending and distortion.

Z.11.2.6 All smiths' work is to be forged clean, all screwed work is to have full internal and external threads.

Z.11.2.7 Frames, etc., are to be well framed together, rigidly fixed, and all connections properly fitted, shouldered, drilled tapped and screwed together with set screws countersunk flush with the surface where indicated.

Z.11.2.8 Welded joints are to be neatly made, filed smooth and left clean and adequate means shall be employed for temporarily fastening the parts to be welded together until the joints are welded.

Z.11.2.9 When requested by the architect and civil engineer, shop drawings are to be provided by the Contractor for approval prior to manufacture.

Z.11.3 Protective treatment

Z.11.3.1 Steel shall be protected against corrosion by hot dip galvanising complying with MSA EN ISO 1461 or as directed by the architect and civil engineer.

Z.11.3.2 All rust, loose scale, oil and dirt shall be removed from all surfaces before treatment.

Z.11.3.3 Small areas of hot dip galvanised coating damaged by welding, cutting or by excessive rough treatment during transit and erection shall be renovated either by the use of low melting point zinc alloy repair rods or powders made specifically for this purpose, or by the use of at least two coats of good quality zinc-rich paint to BS 4652. Sufficient material shall be applied to provide a zinc coating at least equal in thickness to the original layer.

Z.11.3.4 On all galvanised metal works, painting is to consist of one coat red oxide or calcium plumbate on hot dip galvanising and one undercoat and one enamel finishing coat. A sufficient period is to be allowed for the galvanising coat to set/dry out prior to the application of the finishing coat.

Z.11.3.5 Painting is to be in the colour directed by the architect and civil engineer in charge.

Z.11.3.6 Bidders must declare that the following materials/substances will not be used in the building:

a) Products which contain sulphur hexafluoride (SF6)

b) Indoor paints and varnishes with a content of solvents (volatile organic compounds (VOCs) with a boiling point of 250°C maximum) higher than:

- For wall paints (according to EN13300): 30g/l (minus water)
- For other paints with a spreading rate of at least 15m2/l at a hiding power of 98% opacity: 250g/l (minus water).
- For all other products (including paints that are not wall paints and that have a spreading rate of less than 15m2/l, varnishes, wood stains, floor coatings and floor paints and related products): 180g/l (minus water).

NB: Bidders must declare that these products/substances will not be used in the building.

Z.11.4 Green Public Procurement Criteria – Exclusion of certain materials

Z.11.4.1 Bidders must declare that the following materials/substances will not be used in the building:

- Products which contain sulphur hexafluoride (SF6).
- Indoor paints and varnishes[2] with a content of solvents (volatile organic compounds (VOCs) with a boiling point of 250°C maximum) higher than:
  - For wall paints (according to EN 13300): 30 g/l (minus water).
  - For other paints with a spreading rate of at least 15 m^2/l at a hiding power of 98% opacity: 250 g/l (minus water).
  - For all other products (including paints that are not wall paints and that have a spreading rate of less than 15m2/l, varnishes, wood stains, floor coatings and floor. paints, and related products): 180g/l (minus water).

Z.11.4.2 Verification: Bidders must declare that these products/substances will not be used in the building.

[2] Limit values extracted from the European Ecolabel and relevant standards such as EN 13300.

AA. Green Public Procurement Criteria

AA.1 Exclusion of Certain Materials

Bidders must declare that the following materials/substances will not be used in the building:

- Products which contain sulphur hexafluoride (SF6).
- Indoor paints and varnishes1 with a content of solvents (volatile organic compounds (VOCs) with a boiling point of 250°C maximum) higher than:
  - For wall paints (according to EN 13300): 30 g/l (minus water).
  - For other paints with a spreading rate of at least 15 m^2/l at a hiding power of 98% opacity: 250 g/l (minus water).
  - for all other products (including paints that are not wall paints and that have a spreading rate of less than 15m2/l, varnishes, wood stains, floor coatings and floor. paints, and related products): 180g/l (minus water).

<u>Verification:</u>

Bidders must declare that these products/substances will not be used in the building.

SECTION 5 – SUPPLEMENTARY DOCUMENTATION

5.1 – Draft Contract Form

5.2 – Glossary

5.3 – Specimen Performance Guarantee

5.4 – Specimen Pre-financing Guarantee

5.5 – Specimen Retention Guarantee

5.6 – General Conditions of Contract

The full set of General Conditions for Works Contracts is included in the tender package.

It is hereby construed that the tenderers have availed themselves of these general conditions, and have read and accepted in full and without reservation the conditions outlined therein, and are therefore waiving any standard terms and conditions which they may have.

These general conditions will form an integral part of the contract that will be signed with the successful tenderer/s.