Transport Malta

Reference No.: TM043/2020

TENDER FOR THE RECONSTRUCTION OF SEA PLANE SLIPWAY AT TRIQ IL KOSTA BAHAR IC CAGHAQ

Date Published:	**20th January 2021**	
Deadline for Submission:	**16th February 2021**	**at 09:30am CET/CEST**
Tender Opening:	**16th February 2021**	**at 10:00am CET/CEST**

This project is being financed through local budget funds.

IMPORTANT

Clarifications shall be uploaded and will be available to view/download from www.etenders.gov.mt

This e-tender does not require print-outs from this document. Please consider your environmental responsibility before printing.

AUTHORITY FOR TRANSPORT IN MALTA

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SECTION 1 – INSTRUCTIONS TO TENDERERS

1. General Instructions

1.1 The subject of this tender is the reconstruction of a Sea Plane Slipway at Triq Il Kosta Bahar Ic Caghaq.

1.2 The place of acceptance of the works shall be Triq il Kosta, Bahar ic Caghaq (refer to site plan attached), the time-limits for the execution of the contract shall be 90 Calendar Days from commencement date specified in the special conditions, and the INCOTERM2020 applicable shall be Delivery Duty Paid (DDP).

1.3 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 €85,990.94 excluding VAT.

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.

2. Timetable

The timetable is as follows and as per the dates set through the CfT workspace on the ePPS.

	DATE	TIME*
Clarification Meeting/Site Visit	27th January 2021	0900hrs
Deadline for request for any additional information from the Contracting Authority. **Clarifications by registered users to be sent online through www.etenders.gov.mt**	3rd February 2021	0930hrs
Last date on which additional information can be issued by the Contracting Authority	12th February 2021	0930hrs
Deadline for Submission of Tenders (unless otherwise modified in terms of Clause 10.1 of the General Rules Governing Tendering)	16th February 2021	0930hrs
Tender Opening Session (unless otherwise modified in terms of Clause 10.1 of the General Rules Governing Tendering)	16th February 2021	1000hrs
* 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. Clarification Meeting/Site Visit/Workshop

4.1 A clarification meeting/site visit will be held on 27th January at 0900hrs, at Triq Il Kosta Bahar Ic Caghaq (Refer to site plan attached) to answer any questions on the tender document which have been forwarded in writing or are raised during the same meeting. Minutes will be taken during the meeting, and these (together with any clarifications in response to written requests which are not addressed during the meeting) shall be posted online as a clarification note as per Clause 6.1 of the General Rules Governing Tendering.

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

5. 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 tender response format (Note 2)

i. Power of Attorney
ii. Joint Venture
iii. Details of Bidder

If applicable, the necessary forms – such as the Power of Attorney, are to be uploaded through the tender response format by the Economic Operator, as indicated in the relevant fields of the tender structure.

(B) Exclusion (including Blacklisting) and Selection Criteria - information to be submitted through the tender response format (available from www.etenders.gov.mt). (Note 2)

(i) Confirmation that the bidder and any sub-contractors (if any) engaged throughout the execution of the contract do not fall under any of the grounds listed under Part VI of LN352/2016 concerning exclusion grounds including blacklisting through the tender response format.

(ii) Declaration concerning Selection Criteria

Subcontracting Proportion

Provide the name/s of subcontractor/s and the relative percentage of works/services/supplies to be subcontracted. This information is to be submitted online through the tender response format. *(Note 2)*

Any subcontractor proposed and disclosed at this stage shall be evaluated in line with the Exclusion and Blacklisting Criteria as per these Instructions to Tenderers. Furthermore, if the sub-contractor is relied upon by the Contractor to meet the standards established in the selection criteria, apart from submitting the relevant commitments in writing, such reliance will be evaluated to verify its correctness and whether in effect these criteria are satisfied.

It is being understood that if the information being requested regarding sub-contracting is left empty, it will be assumed that no sub-contracting will take place (0% subcontracting).

(C) Specifications

(i) Tenderer's Technical Offer in response to specifications to be submitted online through the prescribed Tender Response Format and by using the Tender Preparation Tool provided. (Note 3)

Key Experts Form, the Statement of Availability Form, the Self-declaration form for Key Experts (relating to public employees) and CVs (Note 2)

Key expert 1: Project manager Warranted (Perit) A&CE (Part Time) (the Perit Warrant must be submitted at tendering stage)

Key expert 2: Site Supervisor/Health and safety officer. (Full Time) (the site supervisor must submit proof at tendering stage, showing that he/she is recognized by OHSA to act as health and safety officer).

Tenderer's Technical Offer (Organisation and Methodology) (Note 3)

(D) Financial Offer

(i) A financial offer calculated on the basis of **Delivered Duty Paid (DDP)** [2010] **(Grand Total)** for the works tendered as per Tender Response Format [inclusive of maintenance for 5 years as applicable to cover the defects liability period]. (Note 3)

(ii) A filled-in Bill of Quantities (as per document available to download online from www.etenders.gov.mt) as per Tender Response Format. (Note 3)

In case of any discrepancy between the information provided in the Financial Bid Form and the grand total in the tender response format (xml tender structure), the latter shall prevail.

This condition shall not apply to financial bid forms constituted of a Bill of Quantities (BoQ), or financial bid forms where the total can be arithmetically worked out and/or corrected if, as, and when necessary / applicable.

Notes to Clause 5:

1. Not applicable for departmental tenders.

2. 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.

All Rectifications are free of charge.

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

Requests for Clarifications and/or Rectifications concerning a previous request dealing with the same shortcoming shall not be entertained.

6. Criteria for Award

6.1 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 – 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 may be indicated afterwards.

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

3.1 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

4.1 Further to the General Conditions all communications shall be with,

Maintenance Dept,
Transport Malta,
Triq Pantar,
Lija

Tel: 25555000

Article 5: Supervisor and Supervisor's Representative

Further to Article 5.1 of the General Conditions, the Supervisor is also referred to in this Contract as the Project Leader/Engineer and shall act on behalf of the Contracting Authority.

The Supervisor shall be responsible for the overall planning, programming, control and co-ordination of the project until final completion, aimed at meeting the Contracting Authority's requirements and ensuring completion on time within the projected costs and quality standards.

The Supervisor is obliged to obtain all necessary applicable approvals before authorising expenditure of any Provisional Sums and Contingencies.

However the Supervisor is obliged to obtain written approval from the Project Leader before authorising expenditure of any Provisional Sums and Contingencies.
The Supervisor might be assisted by a Supervisor's representative: (Any natural or legal person, designated by the Supervisor as such under the contract, and empowered to represent the Supervisor in the performance of his functions, and in exercising such rights and/or powers as have been delegated to him. In this case, references to the Supervisor will include his representative.)

His representative/s enjoy powers such as expected of the Supervisor and/or other powers as deemed proper by the Supervisor due to exigencies of the Contract.

The Supervisor shall also be assisted by Engineering Consultants as necessary.

Article 8: Supply of Documents

8.4 If the need arises, the Contractor is to submit working drawings and/or technical information/data, these shall be submitted to the Supervisor (within the timeframe allocated) who shall liaise with the Consultant to approve or otherwise. In the case of technical information/data the Contractor shall allow a minimum of seven (7) days for the Supervisor to comment. In the case of surveys and shop drawings, the Contractor shall submit these for the approval of the Supervisor at least seven (7) days before the relevant work is due to commence. The Supervisor may request any survey, detail, shop, and or any other drawing produced and/or proposed by the Contractor to be revised and or changed as necessary and/or as he deems fit at the Contractor's expense.

Article 10: Assistance with Local Regulations

10.3 During the execution of the contract, the Contractor is solely responsible to obtain all necessary permits, visas, authorisations or licenses to ascertain smooth running of the works. The contractor must also comply with Planning Authority and Environment Resource Authority for permits and regulations.

Article 11: The Contractor's Obligations

11.1 **Further to the general conditions, the Contractor binds himself to follow and adhere to all the requirements and conditions spelled out in the Planning Authority permit and nature permit attached with this tender.**

11.9 **Further to the general conditions, the contractor must submit a detailed Programme of Works and Gant Chart to the Contracting Authority for its supervisor's approval, within 30 calendar days from the date of the last signature of the contract.**

11.11 **Further to the general conditions, No derogation shall apply.**

11.17 **If the need arises for the Contractor is to submit working drawings and/or technical information/data, these shall be submitted to the Supervisor (within the timeframe allocated) who shall liaise with the Consultant to approve or otherwise. In the case of technical information/data the Contractor shall allow a minimum of seven (7) days for the Supervisor to comment. In the case of surveys and shop drawings, the Contractor shall submit these for the approval of the Supervisor at least seven (7) days before the relevant work is due to commence. The Supervisor may request any survey, detail, shop, and or any other drawing produced and/or proposed by the Contractor to be revised and or changed as necessary and/or as he deems fit at the Contractor's expense.**

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 a copy of the Performance Guarantee. The copy of the Performance

Guarantee forwarded to the Central Government Authority is to be endorsed by the Contracting Authority prior to submission. The contract will not be endorsed by the Contracting Authority/Central Government Authority until the performance guarantee is submitted. The Contractor is therefore obliged to forward the original 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, and 10% where the amount of the total contract value is €500,000 or above.

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.
If a Procurement Procedure was published with lots and subsequently awarded accordingly, each lot shall be regarded as a separate contract, even if the same contractor wins more than one (1) lot. As a result, the amount of the Performance Guarantee shall be calculated per lot.

Economic Operators have the possibility to provide the Contracting Authority with a Single Bond covering the performance guarantees for all the contracts with the same Contracting Authority. If an additional contract is awarded to a given contractor, which results in an economic operator's current cumulative contracts value to go beyond the contract value range currently covered by the Single Bond, the contractor is to be requested to; either submit a separate Performance Guarantee for the additional contract; or else submit a new Single Bond to cover the new total contracts value or submit an amendment to the original Single Bond specifying the new amount. If an Economic Operator chooses to make use of the Single Bond, he must submit a letter from the respective Contracting Authority specifying that the amount of the Single Bond covers the new Contract, otherwise the new Contract Agreement would not be signed.

13.9 The performance guarantee shall be released within 30 calendar days from the date of provisional acceptance, against submission of a retention guarantee of 4% of the certified total of works. This retention Guarantee shall be valid for a period of five years from the date of provisional acceptance.

Article 14: Insurance

14.1 **Further to what is stated in the General Conditions, the insurance policies of the contract shall be in the joint names of the Contractor and the Contracting Authority and shall contain a Cross Liability Clause to the effect that it shall cover claims made by the Contracting Authority notwithstanding that the said policies are also in their names.**

The insured period for each and every policy should start from the commencement of the works until the issuance of the Provisional Acceptance certificate. An insurance policy with the same requirements will have to be effective for any required works during the maintenance period, which is 5 years from the date of issue of provisional acceptance certificate.

The insurances requested in the Special Conditions, are to be extended to cover all the Contractor's operations works, materials, supplies plant and equipment.

The Contractor will be responsible for all the cables (including the earthing cables), from the moment they are delivered to the site until they are installed completely in trench and in PVC sleeves, including the backfilling of the trench as applicable. Any damage to the cables caused by the Cable Laying Contractor, for whatever reason, is to be rectified at the Contractor's expense. Thus, such expenses and liabilities are also to be covered by the Contractor's insurance.

Such cover is to be reflected with respective Insurance Endorsements.

14.4 **The Insurance cover as set out in Article 14.4 of the General Conditions of the contract shall be at least Euro 2,500,000.00 per occurrence with the number of occurrences unlimited.**

14.5 **Notwithstanding the conditions referred to in Article 14.5 of the General Conditions:**

(i) All the insurances referred to shall be taken out within 7 Calendar days of the request by the Contracting Authority or as may be agreed and submitted with the signed contract. The insurances shall be approved by the Contracting Authority.

(ii) The Contractor shall notify the insurers of changes in the quantum, nature, extent and programme for the extension of the Project and ensure the adequacy of the insurance at all times in accordance with the terms of the contract and shall, when required, produce to the Contracting Authority/Supervisor the insurance policies in force and the receipts for payment of the current premiums.

(iii) All insurances referred to in Article 14 shall also be applicable to the Contractor with respect to the Subcontractors.

(iv) Any amounts not insured or not recovered from the insurers shall be borne by the Contractor.

(v) If and so far as the Contractor fails to effect and keep in force any of the insurance policies referred to in Article 14 of the Special and General Conditions of Contract, then the Contracting Authority may effect and keep in force any such insurance and pay any premium as may be necessary for that purpose and deduct the amount so paid from any monies due to the Contractor

14.6 **(i) In addition to Article 14.6 of the General Conditions, in the event that the Contractor fails to comply with conditions imposed by the insurance policies effected pursuant to the contract, he shall indemnify and hold harmless the Contracting Authority against all losses**

and claims (including but not limited to costs incurred / claims made by third parties for loss in business or delays in provision of services) arising from such failure.

(ii) The insurances referred to in Article 14 in these Conditions of Contract shall be affected with insurers to the satisfaction of the Contracting Authority and the Contractor shall be deemed to be aware of the terms and conditions thereof.

(iii) The Contractor shall, with all due diligence, conform to the terms and conditions of such insurances (including conditions, instructions and procedures as laid down in the contract and the Insurance Brochure, Claims Procedures and Insurance Contract Conditions of all insurance policies resulting from the contract) and all reasonable requirements of insurers in connection with the prosecution and settlement of claims, the recovery of losses and the prevention of accidents and shall bear at his own cost the consequences of any failure to comply.

(iv) The Contractor shall bear the cost of all excesses (deductibles), exclusions or limitations applying under the said policies (in so far as these concern risks for which he is responsible under the terms of the contract) whether in respect of claims made against the Contractor and/or the Authority and/or the Supervisor or against the Central Contracting Authority and/or the Government pursuant to the provisions of any enactment.

Article 15: Performance Programme (Timetable)

15.1 Within 15 calendar days from the last date of signature of the contract, the Contractor shall submit a detailed programme of works, for all works, within 5 calendar days of the request by the Contracting Authority or as may be agreed and in compliance with other requirements specified in the Technical Specifications. The programme shall be finalised with the approval of the Contracting Authority.

The updated and detailed Programme of Works is to cover the entire Period of Performance stipulated in Article 32 of these conditions, divided into the specified works. Notwithstanding the requirements under Article 15.1 of the General Conditions, the programme shall also take into account the following:

1) The Method Statement & any permits from statutory bodies;
2) Subcontractors' works;
3) The weather conditions and risks associated with the site;
4) The Technical Specifications including Preliminaries, and the respective drawings;
5) The ongoing surrounding site operations
6) Ongoing works by other contractors, where applicable;
7) Shutdowns and contract closure, including commissioning and testing;
8) Procurement lead times and other logistical considerations.

15.2 The Contracting Authority has the power to ask the Contractor to demonstrate with clear figures the sustainability of the Works Programme, by providing the management of the resources and the instruments for their monitoring. In case of verified delay in the Works and under the condition to apply the contractual penalties for delays in execution as per Article 34, the Contracting Authority has the power to ask the Contractor for a reassessment of the resources, plant, equipment and work process.

The Contracting Authority has the power to specify any resources deemed necessary to carry out the duties specified in this contract and the contractor shall provide them.

15.4 At least 24 hours prior to each site meeting, or as may be agreed with the Supervisor, the Contractor shall submit for approval to the Supervisor an updated programme of works and any other information as may be required by the Supervisor.

Article 17: Contractor's Drawings/Diagrams

17.1 If the need arises for the Contractor to submit working drawings and/or technical literature, these are to be submitted to the Supervisor who shall liaise with the Design Consultant and approve or otherwise. The Contractor shall allow a minimum of seven (7) days for the Supervisor to comment.

Article 18: Tender Prices

As per general conditions.

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 workplace, 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 Project Supervisor regarding any potential risks.

Article 22: Interference with Traffic

Complete closure of access road must occur only in extreme cases, i.e. only when there is no feasible alternative, and for the shortest period possible. In the event of such closure, the contractor must inform TM supervisor, by not less than 7 days prior to such.

Article 26: Discoveries

26.2 As per General Conditions

Article 28: Soil Studies

28.1 Not Applicable.

Article 30: Patents and Licences

30.1 There is no derogation from Article 30 of the General Conditions.

Article 31: Commencement Date

31.1 Commencement date shall be any date chosen by the Authority, after the date of last signature of the contract. An order to start works shall be issued by the Authority after the date of the last signature of the contract, upon which the contractor will have a maximum notice period of 15 calendar days from the date of the order to start works, to mobilize and start works on site. Such order to start the works may be provided up to a maximum of 30 calendar days from the last signature date on the contract.

Article 32: Period of Execution of Tasks

32.1 Performance period shall be 90 calendar days from the date specified in the order to start works.

Article 34: Delays in Execution

A penalty for delay of €250.00 per calendar day will be charged on the contractor if he exceeds the performance period specified in clause 32.1., up to a total amount of 20% of the contract price.

Article 35: Modification to the Contract

35.8 The percentage allowed for repetition of services and circumstances that may lead to such services' requirements is capped at 10% of contract amount. Repetition of works may mainly occur due to a discrepancy in depth levels between the date of the survey and the actual execution of works on site.

35.9 The percentage allowed for additional services and circumstances that may lead to such services' requirements is capped at 10% of contract amount Such additional services may crop up during execution phase when one realizes that with a minor expense (at a point when a contractor is already mobilised) one could bring about improvements, which would otherwise cost much more if these were done after the works are completed. Another factor would be the disturbance to the users.

Article 37: Work Register

37.1 As per general conditions.

Article 38: Origin

38.1 No derogation to the rules of origin shall apply.

Article 39: Quality of Works and Materials

39.2 Notwithstanding the provisions of article 39.1 of the General Conditions, all materials imported to site must be tested to accepted testing regimes and/or as requested by the Supervisor as the need might arise. Tests/certificates of raw material, e.g. cement, aggregate/sand, slag, water, additives stone paving blocks and steel must be conducted and/or produced regularly and/or as requested by the Supervisor as the need might arise. Printed Certificates of compliance and Fit for Use statements must be submitted by the Contractor as requested by the Conditions of Contract and/or the Supervisor
The Contractor shall invite the Supervisor to witness the trial batching and subsequent testing of mix designs and shall provide test data of each approved mix design which test data shall be compiled by an independent testing laboratory.

Article 40: Inspection and Testing

40.2 Inspection and testing shall be carried out on site and/or at a certified laboratory, approved by Transport Malta.

Article 42: Ownership of Plants and Materials

42.2 All materials intended for, but not yet incorporated in the permanent works, which have been delivered on site or at the designated storage site or plant for which payments have been made to the contractor, shall become the property of the Contracting Authority.

The Contractor shall ensure proper packaging so as to provide protection as set in these conditions and technical specifications. The packaging shall remain the property of the Contractor and shall be disposed of adequately in line with legal requirements. Any costs involved shall be borne by the Contractor.

Article 43: Payments: General Principles

43.1 Payments will be made in Euro. This is a Bill of Quantities works contract.

Payments shall be authorized and paid by the Contracting Authority.

43.3 As per General Conditions.

Article 44: Pre-financing

44.2 No pre-financing is allowed for locally funded tenders.

Article 45: Retention Monies

45.1 Retention money amounting to 5% of the gross certified value of works shall be withheld from interim payments.

45.3 Within 45 days from the issue of the Provisional Acceptance Certificate, the 5% retention money shall be released to the Contractor, upon submission of a bank guarantee (Retention Guarantee), as approved by the Contracting Authority and covering 5% of the gross certified value. This guarantee shall be drawn out according to the template provided in the tender document.

The retention guarantee is to be kept valid by the contractor until the expiry of the defects liability period (5 years from the date stated in the Provisional Acceptance Certificate for when Provisional Acceptance was achieved as issued by the Contracting Authority).

Article 46: Price Revision

46.1 As per general conditions

46.2 Where prices may be revised under the contract, such revision shall take into account modifications in the prices of significant local or external elements which served as a basis for the calculation of the tender price, such as manpower, services, materials and supplies, as well as charges laid down by law or regulation.

Prices contained in the Contractor's tender shall be deemed:

a) to have been determined on the basis of the conditions in force up to the date fixed for submission of tenders, in the case of direct agreement contracts, on the date of the contract;

b) to have taken account of the legislation and the relevant tax arrangements applicable at the reference date fixed in sub-criteria(a).

46.3 In the event of changes to, or introduction of, any national or state statute, ordinance, decree or other law, or any regulation or bye-law of any local or other public authority, after the date fixed for the submission of tenders, which causes a change in the contractual relationship between the parties to the contract, the Contracting Authority and the Contractor shall consult on how best to proceed further under the contract, and may as a result of such consultation decide, with the prior approval of the Central Government Authority:

a) to modify the contract; or
b) to provide for compensation for any imbalance caused by one Party to the other; or
c) to terminate the contract by mutual agreement.

46.5 At the end of the period of performance, revised as necessary in accordance with the contract, the Contractor cannot claim for further revision of prices within the submission of the final report.

Article 47: Measurement

47.2 Measurements shall take place in the presence of both the Contractor's representative and the Contracting Authority.

Article 48: Interim Payments

48.1 As per General conditions.

Article 50: Delayed Payments

50.1 The Contracting Authority shall pay the contractor sums due within 60 calendar 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

53.1 ***Malta Funds***
Article 53 of the General Conditions is not applicable.

Article 57: Provisional Acceptance

Conditional to the Provisional Acceptance of the Works, the Contractor shall clear away and remove from the site his plant, all surplus materials, rubbish and Temporary Works of every kind (unless otherwise directed by the Supervisor), and leave the whole of the site and the Works clean and in a workmanlike condition, to the satisfaction of the Supervisor. The Contractor shall be liable for any expense incurred in making good or cleaning other works / property disturbed or damaged when executing his works or otherwise, when such making good or cleaning has to be carried out by third parties. Rectify any environmental impact as directed by the competent Regulatory Authorities and make good any damage inflicted in the affected area including but not limited to the seabed. The Supervisor reserves the right to employ others to remove discarded material left on site or rectify any environmental impact at the Contractor's expense. Provisional acceptance is issued when the contractor carries out all the works set out in the tender document.

Article 58: Maintenance Obligations

The contractor shall carry out maintenance works as he deems necessary for the structure's integrity after execution of contract, for a period of 5 years from date of provisional acceptance.

Article 66: Dispute Settlement by Litigation

66.1 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 Maltese 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.

SECTION 3 – SPECIFICATIONS/TERMS OF REFERENCE/METHOD STATEMENT

(Note 3)

Specifications/Terms of Reference

A.01 Existing Features
The Contractor is to prevent damage to existing buildings, fences, gates, bollards, fenders, lighting masts, walls, roads, bridges, paved areas, trees, third party property and other site features which are to remain in position throughout the execution of the Works. Any damages sustained shall be repaired and made good by the contractor at his/her own expense. The Contractor shall save harmless and indemnify the Contracting Authority in respect of all claims, demands, proceedings, damages, costs, charges and expenses whatsoever arising out of, or in relation to such matters.

A.02 Public and Private Services
The Contractor shall maintain and protect the public and private services including any pipes, ducts, sewers, service mains overhead cables and the like, throughout the execution of the Works.
The Contractor shall:

- Notify all service authorities of proposed works in due time before the commencement of site operations.
- Notify the Resident Engineer of any services present on the site that require re-routing, temporary disconnection or the like to allow execution of the works.
- Notify the Resident Engineer immediately if any damage results from the execution of the works and make arrangements for the work to be made good without delay to the satisfaction of the service authority or private owners as appropriate. If such damage is deemed by the Resident Engineer to be due to negligence on the part of the Contractor, all costs will be borne by him.

A.03 Resident Engineer
The Contracting Authority shall engage a Resident Engineer, through a separate procurement procedure, who shall be responsible for monitoring and supervising all works being done on site.
The contractor shall always liaise and coordinate with the Resident Engineer and shall be responsible to duly inform him/her to inspect and approve all works prior to casting of any concrete.
The Contractor shall agree with the Resident Engineer the intended siting of all equipment, boats; spoil heaps, temporary works and services prior to their use.

A.04 Contract Execution
Contractor to abide to PA approved method statement and relevant ERA conditions unless otherwise instructed. Any changes to methodology proposed have to be previously approved by the resident Engineer in charge and endorsed by the respective authorities.
Unless otherwise instructed by the Resident Engineer in charge no work is to be carried out on Sundays and Public Holidays. On weekdays works are to be carried out between dawn and dusk. Working hours are generally between 06:00hrs to 18:00hrs Monday to Friday and 06:00hrs to 12:00hrs on Saturday. However, concreting works might be carried out overnight to avoid excessive temperatures in the concrete, traffic delays and disturbance to nearby activities. The contractor's attention is being drawn to the fact that owning to the tight timeframes to completion target date of the project, the working hours might at times need to be extended.
It is the Contractor's responsibility to ensure that all personnel engaged throughout the works are qualified, insured and certified.

A.05 Health & Safety, Environmental and Other Requirements

The contractor is to ensure that all works are carried out in line with EU standards, Local Laws, the specifications of this contract and any other relevant guidelines and legislations which may come in force from time to time in Malta during the execution of the contract.

All works carried out shall be in line with the prevailing Occupational Health & Safety Regulations ACT 27 of 2000 (CAP 424), LN 36/2003 & LN 281/2004 and any subsequent legislations which may come into force during the execution of the contract. Works shall respect OHSA requirements and shall be in line with all building permits conditions and ERA requirements and in line with Green Public Procurement obligations.

The Contractor is to be in full compliance with LN 295/2007 Development Planning act (Cap. 356), Environmental Protection act (CAP.435), and Environmental Management Construction Site Regulations 2007.

All personnel employed shall follow Health & Safety & Environmental regulations and shall be equipped with the full Health and Safety gear including safety boots, visibility vests and gloves as deemed necessary.

All equipment used shall be maintained, certified fit for use and shall be used in line with Occupational Health & Safety and Environmental Regulations.

All personnel, drivers and plant operators shall be licensed and trained to carry out the works competently, in line with work practice legislations and in a safe manner.

Works are to be carried out with caution and without causing damage to third parties or public property in the locality and without causing nuisance and disturbance to the residents, fisherman, restaurant owners and the general public in the area.

The Contractor is to prevent debris from being deposited on private and/or public roads, paths, hard-standing, car parks and the like, and immediately remove any unavoidable deposits. The contractor is also to prevent any debris material from falling at sea and is obliged to use a silt-curtain throughout the duration of the works to retain debris material from spreading at sea. In case of such mishaps, the Contractor shall be responsible to clean up and clear all debris and plume at his/her own expense.

A.06 Sanitary Facilities

The Contractor shall provide adequate sanitary and hand washing facilities for all the employees, subcontractors and visitors abiding by all legal requirements and to the satisfaction and approval of the Resident Engineer. The Contractor shall also provide sanitary facilities for the sole use of the Resident Engineer. All sanitary facilities shall be kept clean and hygienic to the satisfaction of the Resident Engineer. All sanitary facilities shall be connected to temporary septic tanks provided and maintained regularly by the Contractor since no drainage system is present on site.

Any employee or subcontractor found to be fouling any part of the site or adjacent properties may be subject to disciplinary action without warning.

A.07 Health & Safety Officer

The Contracting Authority shall engage a registered Health and Safety Officer through a separate procurement procedure, with a relevant qualification recognised by OHSA (or the equivalent national body within an EU state). The latter shall be responsible for monitoring the health and safety of all operatives, subcontractors and visitors on site.

The Contractor shall nominate a liaison person directly responsible for health & safety matters on site. Such person shall liaise and coordinate with the Contracting Authorities Health & Safety Officer and shall be responsible to implement all the measures as instructed to ensure safety on site and adherence to OHSA requirements.

The Project Leader, his nominee, Resident Engineer or Health & Safety Officer will be empowered to carry out spot checks on staff without warning at any time to establish whether they are using appropriate PPE and adhering to H&S regulations.

The Contractor will be informed of any incidences where operatives have been found to be operating inadequately or are not using the appropriate PPE (personal protective equipment). In the event of a similar occurrence involving the same operatives, the Contractor will be given a second warning. In the event of a third occurrence the Contractor will be instructed to remove the operatives from site immediately and they shall not be permitted back onto the site.

No claims for additional costs or time will be considered for such events.

A.08 Safety Boat
The Contractor shall provide a small safety boat throughout the duration of the works in order to facilitate rapid rescue of any operative who falls into the water. The safety boat shall be suitable for the expected sea conditions, useable at very short notice, be stable and sufficiently powerful to reach all areas of the quay edge within 5 minutes from call out. The safety boat shall be low enough to allow operatives to be pulled on board and have a minimum capacity of four persons.
An inflatable or semi-inflatable boat is envisaged. The safety boat is to have all the necessary valid commercial vessel (CVC) certification.
The Contractor shall immediately replace any safety boat considered inappropriate by the Resident Engineer/Project Leader or any safety boat experiencing mechanical problems. The Contractor shall maintain a minimum of one trained boatman on site throughout the works and instigate procedures to train staff (including exercises) to deal with emergencies.

A.09 Environmental Impact & Protection
The performance of the tender shall be subject to environmental monitoring that complies with the requirements of the Water Framework Directive and as directed by the Environment and Resources Authority (ERA). In line with the conditions set in the relevant PA permit conditions, ERA are to be informed when the implementation of the works commences on site so as to ensure that that all the works done conform to the conditions of the permit. A copy of the permits and ERA conditions is being attached to this contract.
The Contractor shall take all reasonable measures to prevent debris and waste water (e.g. from demolition and concreting works) falling into the sea. This includes but is not necessarily limited to designing access scaffold and working platforms to contain debris, regular cleaning of access scaffolds/working platforms and the collection/containment of any waste water/concrete washout generated during works.
The Contractor shall contingency arrangements for dealing with potential spillages of oil, fuel, waste water, materials or debris. Such arrangements shall be maintained on site throughout the contract and brought into action if required; these would include booms with weighted fine mesh or tarpaulin around the work area.
As a minimum the Contractor shall provide an appropriate silt curtain with all associated floats, rope and ballast etc to cover the area of works. The silt curtain shall be deployed at all times throughout the duration of the contract to prevent silt, fines or sediment plumes leaving the work area. Whilst the silt curtain is deployed the Contractor shall monitor the sea and weather conditions. In the event that conditions which may damage the curtain are expected the Contractor shall immediately retrieve the curtain. No claim for additional cost for repair or replacing the curtain due to damage by whatever cause will be permitted.
The Contractor shall remain responsible at all times for the consequences of spillages of oil, fuel, waste water, materials or debris or any other event, caused by the Contractor by any act, omission or through negligence, resulting in Environmental Impact as stipulated under Maltese law. This shall include but not be limited to payment of any fines imposed by Regulatory Authorities and the Contractor shall indemnify and hold harmless the Contracting Authority against and from all costs, liabilities and expenses incurred in respect of any claim, action or proceedings.
The Contracting Authority, if deemed necessary, shall appoint an independent consultant/s to undertake the necessary environmental monitoring as part of the Management of the project. The contractor shall provide all the required assistance and cooperation throughout the duration of the works and shall facilitate access as required for monitoring purposes.
The contractor shall also follow instructions issued to him by the Project Leader, the Resident Engineer, the Environmental Site Manager or ERA representatives, whether these are a result of environmental monitoring findings, construction management issues, or requests by regulatory authorities.
Should the debris collection method adopted by the Contractor prove to be ineffective, such that:

- The level of accumulation of debris on the seabed is not acceptable for environmental reasons; or
- The monitoring programme indicates unacceptable impacts on the marine environment, or
- The Client is given instructions by the Competent Regulatory Authorities to clean the seabed,

The Contractor shall undertake to: Change his work method to conform to the required standards; and Rectify the situation as directed by the Competent Regulatory Authorities and make good any damage inflicted on the seabed, including payment of any fines.

A.10 Security & Protection
The Contractor shall at his own cost be solely responsible and bear all costs for the security of the work areas and his own equipment, plant, materials, temporary works, on the site. Take all necessary precautions and adequately safeguard the Works, his personnel (including sub-contractors) materials, products, plant and personal clothing from damage and theft and will be responsible at the end of each working day for removing

all loose items of materials, product or plant to a safe, secure, lockable store to be provided by the Contractor in a location to be agreed with the Resident Engineer on site. Under no circumstances are delivered materials and goods the responsibility of the Contracting Authority. Delivery notes for materials and goods to be solely checked and approved by the Contractor.
The Contractor shall erect temporary protective walls, hoarding, screens, guard rails, planked footways, gantries and the like as may be necessary for protecting the public and others, including property, for the proper execution of the Works and for meeting the operational requirements of the Planning Authority, OHSA or any other relevant authority. All such temporary protective items are subject to the approval of the Resident Engineer.
The Contractor shall safeguard the site, the Works, products, materials and plant from damage and theft. Take all reasonable precautions to prevent un-authorised access to the site, the works, and adjoining property.
Adequately protect the works, whether temporary or permanent, plant, equipment, material, and the like from damage by weather or sea conditions.
Use all reasonable and approved building aids and methods to prevent or minimise delays during weather or by sea conditions.

A.11 Storm Precautions
The Contractor shall monitor weather and sea condition predictions daily using Met Office and other reliable sources. In the event that a storm is expected, the contractor shall temporarily remove or make secure all works, materials, plant, access scaffolds, cradles, cranes and the like which could be affected during the storm. No work shall be carried out at locations or in conditions where the weather and sea conditions make it unsafe to do so or detrimental to the quality of the works. All items shall be made secure or relocated to ensure they cannot damage or be dislodged to damage the nearby infrastructure.
The Contractor shall be responsible for any damage to his plant and equipment. Damage to third party property due to the Contractor not taking all necessary precautions, shall be made good at his/her own expense. No variation to the contract for additional time and expense will be considered.

A.12 Marine Environment
The works are to be carried out in a marine environment. The Contractor shall provide all necessary personal safety equipment and a safety boat for the duration of all works carried out over the water. No claims for additional cost or delay due to the works being in a marine environment will be permitted.

A.13 Diving Team
Unless otherwise agreed with the Contracting Authority, whenever necessary, the Contractor shall utilize the services of a diving team using umbilical cord, diving equipment and safety working boat consisting of at least 2 divers plus a diving supervisor.
All divers forming part of the dive team shall be in possession of a commercial diver-training certificate, current certificate of medical fitness (not older than 6 months), and current first aid certificate. These documents shall be available on site for inspection by the Resident Engineer and/or the competent authorities. Non-availability of or non-compliance with any of the above will immediately render the diver to a non-diving role.
Within seven (7) days prior to the commencement of any diving operations the Diving Contractor shall furnish to the Engineer a copy of dive team members' insurance certificates and all other necessary notification details and documentation
All items of equipment worn by the diver should be, wherever possible, according to international, European or national standards. Any vessel or work/safety boat is to have all the necessary valid commercial vessel (CVC) certification.
The diving supervisor must have adequate practical and theoretical knowledge and experience of the diving techniques to be used in the diving operation for which he or she is appointed. A person should only be appointed as a diving supervisor if he or she has:

- sufficient experience; and
- passed an approved diver competence assessment

All divers in the water should have a communication system that allows direct voice and high definition visual contact with the diving supervisor and the Engineer on the surface and vice versa. A hard-wired communication system is preferred because the effectiveness of a through-water communication system can be degraded by acoustic shadow, sediment, air bubbles, turbulence etc.

A.14 Site Diary
The Contractor is to keep a properly documented and dated job diary (Work Register) available for inspection when so required.
Record all events relevant to the construction of the Works which shall include (but is not limited to) those mentioned below:

- All instructions issued to the Contractor and the action taken; this shall include verbal instructions and the date of written confirmation.
- Adequate details of day works.
- Weather and sea conditions including any conditions considered relevant for the works.
- Records of tests if not recorded elsewhere.
- Any poor workmanship observed or reported; and condemned work stating the reasons.
- Delays and their causes.
- Details of labour and plant.
- Details of work originally classified as provisional.
- Details in support of any claims for extra payment.
- Measurements and cost information to support valuations and the final account.
- Commencing and completion dates of significant stages of the work, with particular reference to work which requires time to cure or dry out (e.g. concrete).
- Adequate photographs.
- The names of personnel involved in critical activities.
- Details of any accidents or near misses.

A.15 Progress/ Site Meetings
The contractors shall send a competent representative to such site meetings as and when called by the Project Leader, his representative or the Resident Engineer, who shall be fully authorised by the Contractor to accept instructions from the latter and issue instructions to the Contractor's own labour employed on the site.
Meetings will normally be held weekly, or as directed by the Resident Engineer, and the Contractor is to inform sub-contractors when their presence is required. At these meetings the chair will be taken by the Project Leader or the Resident Engineer. All meetings will be minuted by the Resident Engineer or his nominee.

A.16 Prior to Commencement of Works
Prior to the Commencement of Works the Contractor shall submit the following detailed reports:
1. **Method Statement** for each planned activity that shall be involved during the execution of the works. Such are to be reviewed and approved by the Contracting Authority.

2. **Risk Assessment** related to the prepared method statements for each planned work activity identifying envisaged risks that may affect the works, their likelihood and impact and mitigation measures planned in relation to such risks.

3. **Construction Management Plan** which shall include but not be limited to how the contractor will ensure quality of works and compliance to specifications in terms of site setting out, construction methodologies, concrete mix designs and batching operations, temporary works including scaffolding and hoarding, quality of the materials brought to site, site logistics, risk mitigation measures, health & safety and environmental measures and emergency situations.

4. Updated time plan in the form of a detailed **Gantt Chart** indicating tasks, task durations, task sequencing and milestones. Such gantt chart should give more specific detail than the gantt chart submitted at tender stage.

5. **Quality Assurance & Control Plan** which shall indicate the quality policy and the management system (including copies of valid accreditation of an independent testing laboratory) which the contractor plans to adopt to ensure quality of works and successful completion of the project.

6. **Site Waste Management Plan & General Environmental Plan** wherein the contractor is to detail his waste management system and the environmental policy (including a copy of valid accreditation by an independent body) and outline his proposed set-up and procedures to

ensure environmental control of the site and minimize environmental impact and waste generation while demonstrating compliance with ERA and permit conditions.
These documents shall be reviewed and approved by the Contracting Authority. In the event that these documents are not considered satisfactory, the Contractor shall not be permitted to progress with any work until these have been rectified to the Authority's satisfaction.

A.17 Topographical Survey & Condition
Reports Topographical Surveys
Before work commences on site, the Contractor shall take a topographical survey of the surrounding areas. This shall be used to ensure that all new concrete surfaces are cast to the same levels and to the same gradients as the existing concrete surfaces unless otherwise instructed by the Project Leader or the Resident Engineer.
The Contractor shall take all measurements, establish all levels, setting out etc. and be solely responsible for the correctness of the same. He/she shall also be responsible to check the dimensions and position of all ancillary items including timber sleepers, their respective bolts and mooring hooks amongst other things and record the data on drawings such that these can eventually be adequately repositioned during the execution of the main works.
Any benchmarks for use by the Contractor shall be adequately protected against damage during the execution of the works. The cost of the surveyor shall be borne by the Contractor.
Condition Reports Before work commences on site, the Contractor shall also draw up a Condition Assessment Report to as a minimum keep a record of the state and conditions of the existing slipways, the surrounding quay and infrastructure, the access routes over third party/government property and any other third party properties located in the vicinity of the site. Such condition report is to be taken in the presence of the Resident Engineer and is also to be approved by the latter.
The contractor shall also draw up a similar Condition Assessment Report after the Completion of the Project.

A.18 Site Mobilization
The Contractor is responsible to erect appropriate hoarding and gate along the landside boundary of the site prior to starting works to prevent access by unauthorized persons to site. Such hoarding shall be erected in such a way so as to cause the least disturbance to the surrounding activities. The Contractor needs to provide signs and adequate lights during the night to delineate hoarding and any other site hazards.
The Contractor is also responsible to gain necessary access to the area if applicable. He/she is responsible for obtaining all necessary permits including but not limited to Notice to Mariners if deemed necessary.
Prior to carrying out demolition works; the contractor is to propose ways how to ensure that debris material does not fall into the sea. This may be in the form of a temporary shutter erected along the edge of the slipways/quay.
In the submitted rates, the Contractor is to include allowance for barges and other sea craft required during the works and for any specialized trades such as divers, equipment and consumables required for the whole duration of the works, if and wherever these are deemed necessary.
Contractor is to provide the necessary services including sanitary facility, water, electricity and telephone/mobile connectivity to his workforce.

A.19 Plant required
Contractor will have to make use of equipment, which is considered indispensable to carry out marine structures.
These include:
i) Excavator crane, compressors and air lifting equipment, back hoe with grab pneumatic hammer capable of working in the marine environment.
ii) The contractor besides providing the necessary plant will also provide riggers and tackles and divers.
B. Site Specifications

B.01 Excavation
The Contractor will demolish, excavate, scarify and dispose of all the materials of whatever geological formation, quality, consistency or description to the extent necessary or as may be ordered or required for the proper construction and completion of both the Permanent and the Temporary Works in full accordance with the Contract Documents.
All boundaries of dredging areas shall be established by the Contractor subject to the Engineer's approval. All setting out of dredging works shall be carried out by the Contractor.
The contractor shall propose a dredging method which he/she believes will be the most suitable to dredge the type of material to be removed. Dredging shall be carried out by using the appropriate dredging equipment with sufficient capacity to dredge the required volumes of materials within the requested

timeframes. All dredging should avoid overspill to minimize the suspension of dredged sediments in the sea. The Contractor is responsible for undertaking at his own cost, all appropriate mitigation measures.
The Contractor must make sure that the depths in the existing area and its surroundings are not reduced by the operation. A side slope adjacent to the dredged area shall be formed during the dredging process to stabilise the adjacent material. Furthermore, the contractor must bear the full responsibility and be liable for any damage to boating or other marine structures, while also removing at the Constructor's cost, any material displaced into adjacent area by the operations.

B.02 Tolerance in dredging and excavations
No excavation will be carried out to a depth of more than 300mm below the specified level within5m of the existing quays or revetted slope. Should any excavation beyond this depth be carried out within the aforesaid d 5m the excess will be filled with approved material at the contractor's expense.

B.03 Disposal of cleaning and excavations
The Contractor shall dispose of and decontaminate where applicable, all arising, materials, debris waste, rubbish and the like off site at approved landfill sites. All operations concerning the management of waste are subject to the Waste Regulations, 2011 (Legal Notice 184 of 2011, as amended, S. L. 549.63) and Waste Management (Activity Registration) Regulations, 2007 (Legal Notice 106 of 2007, S.L. 549.45). If the Contractor opts to use barges for disposal of the waste material, approval is to be obtained from the Local Authorities and the 'consignment note' system must be used. The Contractor shall include in his rates for any costs incurred in separating or treating waste sufficiently to allow disposal at approved sites and all dumping charges.
All wastes shall be separated according to the different waste streams as per EWC codes as defined in Commission Decision 200/532/EC and deposited in sites permitted by ERA to accept such wastes.

B.04 Material for filling (if applicable)
The boulders for the revetment, will be good, well graded, granular material obtained from hardstone quarries. No mud, organic or other unsuitable material, or more than 5% silt will be deposited in these areas.

B.05 Specification for Revetment Earthworks (if applicable)
General Requirements
Unless otherwise agreed by the Engineer all materials and workmanship shall be in accordance with the appropriate European Standards at the time of tender and where applicable, the I.C.E. 'SPECIFICATION FOR GROUND TREATMENT'. Where the requirements of European Standards are in conflict with this specification, the latter shall take precedence.
Subject to the approval by the Project Manager, materials may be supplied conforming with other recognized standards which correspond closely with European Standards.
In the event that the Contractor proposes the use of an alternative standard, he shall provide the Project Manager with a copy of the proposed standard together with an authoritive translation into English, where the standard is in a language other than English.
All materials and workmanship shall be in accordance with this specification. Where there may be a conflict in requirements between the specification and the particular specification for any method of ground treatment the latter specification shall take precedence.
Performance
The execution of the reclamation and the fill and treatment of the ground is the responsibility of the Contractor who shall nonetheless; satisfy the Project Manager that all treated ground has attained the required degree of improvement.
The Contractor is to monitor any settlements in the works during construction. This is to be detailed for the approval of the Project Manager.
The Contractor shall supply detailed and dimensioned layouts of any treatment points to the reclamation and fill in digital format for the approval of the Project Manager. Such approval shall not remove the responsibility of the Contractor for the accuracy of the drawings. Each treatment point shall have a unique reference number for record purposes.
Prior to the commencement of the reclamation and fill the Contractor shall provide a detailed method statement. This shall include a programme giving the full details of both type and quantity of all plant he proposes to use to include suitability, efficiency and adequacy of said plant, the order of carrying out the work and where not already specified by the Project Manager the detailed and dimensioned layout of any ground treatment, type and frequency of the proposed control testing and where applicable the anticipated ground level after treatment.

B.06 Sources of material

The supply of all materials shall be sourced by the contractor and approved by the project manager prior to their use. Such approval shall not remove any responsibilities of the contractor to ensure that the materials used in the works meet specification requirements.
The sources of supply of any material together with laboratory tests to identify the characteristics of the Materials shall be sent to the Project Manager by the Contractor. The contractor is to state the volume of material available at source.
The contractor may propose new sources of fill material for the Project manager's approval provided that the proposed materials meet the specification requirements and are of sufficient quantities to warrant a testing programme.

B.07 Types of material to be used in the reclamation and fill
Introduction
The Contractor shall supply to the Project Manager details of all fill methods to be used in the Works for his approval. These details will include a programme of the type and frequency of the proposed control method for each type of material submitted for the Project Manager's approval. The Project Manager's approval will not relieve the Contractor or any of his responsibilities in ensuring that the material meets specification requirements.
▫ All fill materials used on site are required to meet with the Project Manager's approval.

▫ The following designated fill types shall be used as indicated on the drawings:

▫ Rock to be clean

1	Apparent specific gravity not less than [Test method BS EN 812]	22kN/m^3
2	Porosity of rock material not less than	15%
3	Aggregate impact- Value smaller than (Test Method) in BS EN 812	30%
4	Uniaxial Compressive Strength not less than ASTMC 170 or ASTM D2938-719)	40MPa
5	Abrasion Resistance not greater than Test Method ASTM C 131-81)	50%
6	Prismoidal shape of rock. maximum ratio of maximum and minimum dimension	2%

The Contractor will take appropriate measures to separate rocks into the appropriate categories in the quarry. Neither rocks of smaller sizes than those specified or indicated on the drawings nor earthy sand or clay will be placed in the underwater foundation and any such material will be removed by the Contractor. All rock is to be washed at the quarry before leaving to the site.
Type 3: 2.5- 3.0 Tonne Hardstone Boulders (if applicable)
The contractor shall protect his construction as much as possible from erosion by waves, currents etc. during the construction of the revetment

The Tenderer must submit a detailed method statement for placing any material including details of any proposed method of compaction.
This method statement shall also include the order of carrying out the works, the type and quantity of the Contractor's equipment to be used, together with details to substantiate its suitability, efficiency and adequacy for this type of work.
Prior to commencement of the works, the Contractor must submit to the Project Manager for his approval details or the source of the material and its particular characteristics.
Prior to commencement of fill operations, the Contractor shall clear all organic material from the base and toe of the fill area, and which may prove detrimental to the fill operation if allowed to build-up.

B.08 Testing
The contractor must submit his programme for testing to be carried out prior to, during and after the revetment operations. The programme has to show clearly the contractor's proposal for ensuring that the

specification requirements are met throughout the revetment operations and will include the type and frequency of the proposed control testing.
The Project Manager reserves the right to out his own independent testing programme for the duration of the Contract or part thereof.
Should the Project Manager choose to carry alit his own testing programme this will not relieve the Contractor of his responsibility to ensure compliance with specification requirements.
All costs, charges and expenses incurred by the Contractor for these tests, shall be deemed to be included in and covered by the rates and prices in the priced Bill of Quantities, whether or not such requirements arc specifically mentioned in the Bill of Quantities.

B.09 Silt Curtains
Silt curtains shall be used to contain sediment losses during placing fill / boulders. The Contractor shall be responsible for the design, installation and maintenance of the silt curtains to minimize the impacts on the water quality and the protection of water quality at water intakes as described above. The design and specification of the silt curtains shall be submitted by the Contractor to the Engineer for approval.
Silt curtains shall be formed from tough, abrasion resistant, permeable membranes, suitable for the purpose, supported on floating booms in such a way as to ensure that the sediment plume shall be restricted to within the limit of the works area.
The silt curtain shall be formed and installed in such a way that tidal rise and fall are accommodated, with the silt curtains always extend from the surface to the bottom of the water column. The removal and reinstallation of such curtains during high wind conditions shall be as agreed with the PM.
The Contractor shall regularly inspect the silt curtains and check that they are moored and marked to avoid danger to marine traffic. The Contractor shall repair any damage to the silt curtain promptly and the works shall be stopped until the repair is affected to the satisfaction of the Engineer.
The silt curtain is to be left in place for at least three days after the works have been finished to ensure that any fine silt settles prior to removal. Furthermore, the silt curtain should be removed in a vertical manner ensuring to minimize disturbance of the seabed materials.
C. CONCRETE - Reinforced and Mass Concrete

C.01 Cement
The cement to be used in the Works shall be Ordinary CEM 1 or Rapid Hardening Portland Cement complying with BS EN 197-1. In addition, the tricalcium aluminate content shall not exceed 8% by weight, and the acid soluble equivalent sodium oxide content when measured in accordance with BS EN 196-1:1995 shall be the minimum obtainable from local manufacturers.
The Contractor will provide manufacturer’s test certificate to verify the compliance of the cement with the Specification.
During transportation and after delivery, the Contractor will protect the cement from deterioration and particularly from contact with water including condensation, rain, and wind blow spray. The cement will be stored in approved silos or dry, well ventilated and completely weather proof sheds with damp-proofed floors and protected from flooding during adverse weather or tidal conditions.
Consignment of cement will be used in the order in which they are delivered, and each consignment will be distinctively marked to show manufacturer and date of delivery.

C.02 Aggregate
The materials for use as concrete aggregate will be naturally occurring non-alkali reactive stone of the hardest description, specially selected and complying with BS EN 12620:2002+A1:2008. The Contractor will draw samples of aggregates from stockpiles on the Site, or at the source particular reference to the alkali-aggregate reaction and any other deleterious effect of any chert content of the aggregate, taking into account the cement used in the Works.
All sea dredging aggregates will be washed with clean, fresh water.
Aggregates for use in the works will have the following properties: -
Test Performance

- Soundness (ASTM C88) Weight loss than10% after 5 cycles sodium sulphates
- 10% Fines Value Not Less than 75kN (B.S.812)
- Aggregate Impact Value Less than 30% (B.S.812)
- Aggregate Abrasion Value Less than 25%
- Flakiness Index Less than 40% for 40mm aggregate (B.S.812) Less than 35% for 20mm aggregate

- Elongation Index Less than 30% (B.S.812)
- Water Absorption Less than 3%

The amount of deleterious Substances in aggregates will not exceed the following limits: -

		Coarse Aggregates	Fine Aggregates
		(percentage by weight)	
1	Clay Lumps and friable particles	2	3
2	Soft Particles	5	3
3	Fines passing the 75-micron sieve	1	5
4	Pyrites express as SO_3	NIL	NIL
5	Chert and similar deleterious substances	3	3

The grading of coarse aggregate will comply with the gradings of BS EN 12620:2002+A1:2008. Fine aggregate grading will comply with Grade C or M of BS EN 12620:2002+A1:2008. Sands for mortar and grout will be selected as suitable for the particular use.
The Contractor will at all time maintain on the site such quantities of each type of aggregate are considered to be sufficient to ensure continuity of work. Each type and grading of aggregate will be stored in separate bins or compounds. The floors of the bins will be of concrete or other approved materials and shall have sufficient slope to ensure adequate drainage of surplus water.

C.03 Admixtures
Before additives or admixtures are added to the concrete, the Contractor is to obtain approval from the Engineer in charge. The contractor shall provide all the specifications of the additives he/she intends to use in the concrete mix.
Calcium chloride and admixtures containing calcium chloride shall not be used.
Unless otherwise specified all admixtures should conform to BS EN 934-2:2009+A1:2012. All additives used shall be mixed as per manufacturer's recommendations in relation to cement content. The contractor is to inform the Resident Engineer if in order to meet the requirements of the concrete mix he/she intends to use additional admixtures to those specified in this tender document.
All admixtures shall be mixed with the concrete at the concrete plant during the 'patching process. No admixtures or water shall be added to the concrete on site or at any time after the patching process is complete.
All admixtures shall be mixed with the concrete at the concrete plant during the batching process. No admixtures or water shall be added to the concrete on site or at any time after the batching process is complete.

a) Rust Inhibitor
The Rust inhibitor Admixture is to be the type that is added to the concrete mix at the plant during mixing and prior to casting of same concrete. The purpose of the admixture shall be that to inhibit the corrosion process of the reinforcement contained within the concrete with the aim to extend the life of the structure and reduce the possibility of spatting concrete. The admixture shall be adequate for use in a marine environment. The Contracting Authority will confirm in writing which product is to be used prior to application, following a request by the Contractor. The Authority reserves the right not to affect any payments if the product is found to be of an inferior quality.

b) Sulphate Resistant Admixture
The Sulphate Resistant Admixture is to be added to the concrete to increase the durability of the concrete in the harsh costal environment by providing protection against extreme weather conditions and salt attack. The admixture is expected to increase the impermeability of the concrete mix and therefore provide an increased chemical resistance to the concrete structure. The Contracting Authority will confirm in writing

which product is to be used prior to application, following a request by the Contractor. The Authority reserves the right not to affect any payments if the product is found to be of an inferior quality.

c) Anti-Washout Admixture
The Anti-Washout Admixture is to be added to the concrete mix in order to increase the cohesion of the concrete mix and enable casting of such concrete underwater. Such admixture is to prevent washout of the fine particles and avoid segregation and dispersion of the concrete into the sea. The Contracting Authority will confirm in writing which product is to be used prior to application, following a request by the Contractor. The Authority reserves the right not to affect any payments if the product is found to be of an inferior quality.

d) Silica Fume
All concrete used in the construction of the breakwaters shall be ultra-low absorption concrete. To this effect, concrete shall contain silica fume as a cement replacement additive used in accordance with manufacturer's dosage recommendations. Such admixture is to improve the concrete's properties in particular its abrasion resistance and its permeability resistance to chloride. The Contracting Authority will confirm in writing which product is to be used prior to application, following a request by the Contractor. The Authority reserves the right not to affect any payments if the product is found to be of an inferior quality.

C.04 Water
Water for concrete mix to is to be free from salts and any organic matter. It should be as specified in BS EN 1008 -2002: Mixing water for concrete.

C.05 Accuracy
The batching equipment will be capable of delivery materials with the following accuracy:
Cement -0 + 1%
Water -1 + 1%
Aggregate -2 + 2%
The Contractor will provide standard test weights and any other necessary equipment required for checking the operating performance of each scale or measuring device; such checks will be carried out periodically.

C.06 Chloride and sulphate content
The total chloride ion content of all materials used for making concrete shall be less than: -

- For mass concrete 0.6 per cent
- For reinforced concrete 0.3 per cent
- For any concrete using sulphate Resisting cement 0.15 per cent expressed as a percentage, by weight, of the cement.

The total sulphate content of the concrete will not be more than 3.0 per cent by weight of the cement.

C.07 Steel Reinforcement
All reinforcement shall be delivered to site in clearly identified, tagged bundles, mats or prefabricated assemblies and shall be stored on site in a manner so as not to be contaminated or otherwise damaged. Fabric shall be stored flat.
All reinforcement used should be clean and free from oil, rust or any other foreign material. Unless otherwise specified it should have yield strength of 500N/mm² and conform to BS EN 4449:2005+A2:2009. Steel mesh fabric reinforcement shall conform to BS EN 4483 (or equivalent).
All bends in bars should be done cold. Reinforcement should be discarded if there are any signs of cracks. Reinforcement must not be roughly handled, dropped from a height, or subjected to shock loading or mechanical damage.
At the time of placing concrete, the reinforcement is to be clean and free of corrosive pitting, loose mill scale, loose rust, oil and other substances which may adversely affect the reinforcement, concrete, or bond between the two.
During fixing, contractor is to use necessary fixtures such as spacers and chairs as necessary. The contractor shall detail, supply and fix all such spacers. The materials and workmanship of spacers shall be in accordance with Eurocode 2 and BS 7973 or equivalent Spacers and chairs for steel reinforcement and their specification. The contractor shall ensure that the spacers have the required performance characteristics. Contractor is to fix the reinforcement in such a way that it does not dislocate prior or during the casting process. The cost for provision, manufacture and installation of spacers and chairs shall be borne wholly by the Contractor.

Unless otherwise specified, the Contractor is to tie the reinforcement using 16 SWG annealed tying wire and is to ensure that tying wire does not intrude into the concrete cover. The Contractor is not to tack weld reinforcement unless authorised by the Resident Engineer in charge. Reinforcement shall not be fixed or placed in contact with nonferrous metals.
Laps unless otherwise instructed are always to be 40 times the bar diameter.
The Contracting Authority and the Resident Engineer in charge are to be notified at least 24 hours in advance of concrete casting to respectively arrange for concrete tests and inspect reinforcement prior to concreting.

The Contracting Authority reserves the right not to certify or reject any areas of works where the reinforcement gets casted into concrete prior to inspection.
Unless otherwise stated, all reinforcement shall a concrete cover of 80mm.

C.08 Characteristics of concrete
The grades of concrete to be used in the Works will be as indicated in the Contract Documents. For each grade of concrete, the composition and the characteristics when tested in accordance with BS EN 1881 and this Specification will comply with table No.4.1 below. The composition of the various classes of concrete is intended to produce concrete with the required durability and shrinkage characteristics as well as the required strengths and water tightness. No reductions below the specified minimum cement contents or increase in the specified maximum water-cement ratios will be made on the grounds that the cube strengths obtained appreciably exceed those specified. The minimum cement content per meter cube of concrete shall be 380kgs.
At the discretion of the Contractor the water-cement ratio of any mix may be increased in hot, dry weather by to 0.05 to compensate for evaporation during placing.

C.09 Consistency and Workability of Concrete
The concrete will be of such consistency and workability within the range specified that it can readily be worked into corners and angles of the formwork and around the reinforcement without segregation of the thoroughly compacted with the means of compaction provided. When the formwork is struck, the concrete will present surfaces which are uniform, free from honeycombing surface crazing, shrinkage cracks and excessive dusting.

C.10 Trial Mixes
Before any concrete is placed in the Permanent Works the Contractor will prepare laboratory and full-scale trail mixes and make preliminary tests and modifications as may be necessary.

C.11 Testing of Concrete
The consistency of the concrete shall be measured by a slump test prior each concrete pour which in no case shall be more than 100mm. The slump shall be carried out in accordance with BS EN 12350-2.
Cube tests shall be made in approved 150mm moulds from samples taken in accordance with BS EN 1881 (or equivalent) and shall be taken from at least every 20m^3 of concrete being poured.
Each cube shall be marked on its surface without any etching of the surface with a distinguishing number and the date, and a record shall be kept on site giving the following:

- Cube number
- Date made
- Location of work within the site
- Design mix
- Name of person taking sample
- Crushing tests results
- Date
- Strength
- Density

- In the Case of Ready-Mix Concrete, the Delivery Note No.

At least four, preferably six, test cubes from each sample shall be made in approved 150mm moulds, two, preferably three, to be tested at 7 days, and two, preferably three to be tested at 28 days. In each case, the average of the two or three results shall be taken as the test result.
All cubes shall be stored on site in their mould for at least 24 hours, in a place free from vibration, under damp matting and completely covered with polythene. When the concrete has achieved sufficient strength, the cubes shall be demoulded and immediately submerged in a tank of water until they are taken to the approved independent testing laboratory. No cube shall be dispatched before it is 3 days old. The testing laboratory shall be approved by the Engineer in charge before the commencement of the concreting operations.
One copy of all test cube results shall be forwarded to the Engineer in charge. The concrete in each grade will be considered acceptable if the average of any four consecutive 28-day test results exceeds the specified grade by 3N/sq.mm, and if no individual 28-day test result is less than the specified grade by 3N/sq.mm.
The 7-day test result will be compared to the 7 - day result obtained in the trial mixes, and the Contractor advised of the potential problems in any instances where the test result is more than 2N/sq.mm less than the trial mixes.
The Contractor shall also allow in his rates for concrete, for all expenses in connection with the preparation, conveying to the testing laboratory, and for the testing of the test cubes.

C.12 Target Mean Strength
The concrete mix will be designed to have a mean strength greater than the required characteristic strength by at least 45N/mm squared.

C.13 Concreting in Hot Weather
No restrictions will normally be placed on concreting in hot weather, i.e. when the temperature in the shade at any time during the day may exceed 30ºC, but in such weather the Contractor will take the following precautions: -

- Aggregate stockpiles shall be sprinkled with water to encourage cooling by evaporation successive layers being watered when stockpiled.

- Concrete materials will be protected from direct sunlight as far as possible before, during and after mixing.

- Cool ice water will be used for mixing, arrangements being made to cover, bury, insulate and/or paint white the storage tanks and pipes.

- Shuttering, formwork and reinforcement will be mist-sprayed with cool water immediately before the concrete is placed.

Special emphasis on the care with the protection and curing of the concrete will be exercised; shuttering will be kept cool and protected from direct sunlight as specified in Clause 419 hereof. General concrete mixing and placing will not be undertaken when the ambient temperature is above 40ºC or when the temperature of the mixed concrete rises above 32ºC. Records will be kept by the Contractor of the air temperature, general weather conditions, relative humidity and the temperature of the concrete, ingredients, mixed concrete and concrete placed in moulds or between shutters. Sea water will not be used for any of the abovementioned cooling processes.

C.14 Formwork
Design and construction of formwork shall be in accordance with the following where applicable:
▫ BS 5975:2008+A1: 2011 or equivalent Code of practice for falsework. Formwork: a guide to good practice (Concrete Society, second edition 1995)

- CIRIA Report 136 Formwork striking times - criteria, prediction and methods of assessment (CIRIA, 1995)

- Eurocode 2: Structural use of concrete. Part 1 Code of practice for design and construction.

- BS 6349-1-3:2012: Maritime Structures. Part 1 Code of practice for general criteria.

The contractor shall be responsible to design and erect formwork to withstand the worst combination of the total weight of formwork, reinforcement and concrete; construction loads including dynamic effects during placing and compacting of concrete and construction traffic and wave and wind loads.
Adequate propping including adequate supports shall be used to prevent deflection of the formwork and damage to the structure. All formwork must be adequately braced and strutted even during the maturing period of the concrete. Such supports and bracing shall also all be provided by the Contractor. The concrete shall be supported in the required position until it has adequate strength, as determined by the contractor, to support its own weight and any construction loads, without short-term or long-term distress. Formwork may be struck at a time determined by the contractor, considering the concrete strength at the time of removal, the ambient conditions and by the curing and protection of the concrete that is to be used when the formwork has been removed.
The Contractor shall bear all costs for the manufacture, delivery, erection, dismantling, alterations to and maintenance of such formwork. The formwork shall be designed to enable the formation of any keys, grooves, tongues, drainage/culvert outlets, recesses, steps, nosing, chamfer, curves, etc. as indicated on the drawings, Bill of Quantities or as may be required/instructed by the Resident Engineer.
Formwork faces in contact with concrete shall be free from adhering grout, projecting nails, splits or other defects. The Contractor must make sure that formwork is such to give a reasonable smooth finished face to concrete placed against it. Formwork shall be removed carefully to avoid damaging the concrete surface. Any damage so caused shall be made good by the contractor to the acceptance of the Project Leader or Resident Engineer. Any cavities, bulges, etc. are also to be made good with a sand cement mix in the ratio of 3:1 respectively.
The contractor shall choose release agents to suit the method of construction and the finish required. All release agents used shall be non-staining, non-injurious to the finished concrete and shall not be adversely affected by the weather.

C.15 Chases, Recesses, Grooves, etc.
Provision will be made in concrete by means of shutters, polystyrene cores or otherwise for all keys, grooves, tongues, greased joints, drainage outlets, manholes, girder recesses, steps, nosing, chamfer, curves, etc. that are shown on the Drawings or that may be required.

C.16 Construction Joints
Construction joints will be provided at the locations shown on the Drawings and at such other location as may be necessary.
Joint faces will be prepared as required and where shown on the Drawings, shall be keyed.

C.17 Depositing Concrete by Skips, Etc.
When concrete is to be deposited in the dry, suitable skips will be employed so that in all cases the materials may be handled and placed in position. Concrete will not be deposited through a chute or dropped from vehicles or otherwise through a greater height than 2 metres, unless a tremie pipe/concrete pump is used to place concrete underwater. The discharge end of both type of tremies shall

C.18 Depositing Mass Concrete Under Water.
Underwater concrete shall be casted under water by means of a tremie equipment which must consist of a tube, having a diameter of not less than 250mm. The discharge end shall have a good seal not to allow the water to enter the tube at any time. The tremie may also be a bottom dump tremie bucket which shall be equipped by a closing top and engineer approved.
Underwater concrete shall be deposited in a way that is approved by the engineer. To prevent segregation, concrete deposited under water must be carefully deposited in a compact mass immediately in its final position. Underwater concrete depositing process shall be carried out continuously from start to finish, while the concrete's surface shall always be kept as horizontal as possible. Additionally, to ensure proper bonding between different casts, each succeeding layer of concrete shall be deposited before the preceding layer has taken its initial set.
Further, recommendations are contained in the Technical Report, *Underwater Concreting published by the Concrete Society, Framewood Road, Wexham, Slough SL36PJ.*

C.19 Depositing Concrete in Layers Sections.
In all cases concrete will be deposited in lifts, layers or sections of such height, thickness and size as shall suit the dimensions of the work in hand and the method of compaction. Unless otherwise specified rough cross shuttering with rough vertical keys and if necessary horizontal keys, both of approved dimensions will

be provided to break the joints of the other. Care will be taken when fixing the cross shutters to avoid enclosing a greater area than can be finished to the full height of the shutters

C.20 Vibrators
Sufficient mechanical vibrators of approved types with a minimum frequency of 8,000 cycles per minute and suitable for the workability of the particular class of concrete will be used for compacting the concrete, so that during vibration a thin film only of cement grout appears on the surface, that internal vibrators penetrate under their own weight and that when the vibrator is withdrawn slowly no cavities remain in the concrete. Vibrated concrete is to be placed in layers not more than 600mm in height, each layer being vibrated independently. Reserves of serviceable vibrators comprising at least 50 per cent of the number being used at any time will be kept close to the points where concrete is being placed in readiness to replace any which become defective.

C.21 Concrete Curing
All reinforced concrete work shall be designed, mixed, placed, compacted and cured in accordance with BS EN 1992-1-1:2004+A1:2014 to the approval of the Architect in Charge.
Minimum period of curing shall be as indicated in BS EN 1992-1-1:2004+A1:2014. Concrete must be protected during hardening from the harmful effects of the weather or running water. The protection shall be applied immediately after completion of placing, by one or more of the following methods:
(i) by covering with a layer of sand, sacking, canvas, hessian, straw mats or similar absorbent materials and keeping constantly wet for 72 hours.
(ii) by thoroughly wetting and then covering with a layer of approved waterproofing paper or plastic sheet or insulated mats kept close to the concrete for 72 hours.

C.22 Removal of shutters and centering
The following minimum times will elapse after depositing concrete in shutter before latter maybe removed (where applicable): -
Mass Concrete 16 hours
Sides to reinforced beams and slabs 24 hours
Sides to precast beams and slabs 18 hours
Props to slabs under 305mm in thickness 08 days
Props to slabs under 305mm in thickness
and all beams 16 days
The design of the shuttering may permit soffit shutters to beams and slabs to be removed without disturbing prop, in which case they may be removed, after 5 days in case of slabs or 10 days in case of beams. The Contractor will ensure that not shuttering or centering is struck nor supports removed until the concrete has developed sufficient

C.23 Surface Finishes
General
The surface finish of all exposed concrete will be as specified and will exhibit true, uniform faces of the correct dimensions, shapes and profiles as shown on the drawings or specified and will be free from all honeycombing, blemishes, defects and other irregularities. Any concrete exhibiting honeycombing will be made good by the Contractor in such a manner that it matches the original surface perfectly, failing which it shall be wholly cut out and replaced.

C.24 Surface finishes from Formwork or moulds
The faces of all concrete cast against formwork or moulds will comply with one of the following grades: -
Grade A - obtained by the use of properly designed formwork or moulds of closely jointed sawn boards. Small blemishes will be permitted, but the surface shall be free from voids, honeycombing or other large blemishes.
Grade B - obtained by the use of properly designed forms of closely joined wrought boards, or steel or other suitable material. Small blemishes will be permitted, but the surface shall be free from voids, honeycombing or other large blemishes.
Grade C - obtained by the use of high-quality concrete and properly designed form shaving a hard, smooth surface. The concrete surface should be smooth with true, clear arises. Only very minor

C.25 Protecting and curing concrete
All concrete work will be protected by the Contractor from the possibility of damage in an appropriate manner.
Immediately the placing of concrete in any section of the Works has been completed, the exposed surfaces thereof will be covered with two layers of damp Hessian, which must be kept damp. The whole of that

section of the works, including the formwork, will also be protected from direct sunlight, so that both the evaporation of water from the concrete and the temperature changes of the surfaces of the concrete are kept to a minimum.
When not less than 16 hours for mass concrete or 24 hours for reinforced concrete have elapsed after the concreting has been completed, side shutters may be removed if replaced immediately by Hessian kept moist with all edges jointed or overlapping to prevent evaporation.
These coverings and protection will remain in place for at least a further 7 days for mass concrete or 14 days for reinforced concrete or until the concrete is immersed, whichever is the earlier.
When the side shutters are struck, a membrane curing compound instead of the Hessian may be used, which will be applied without delay all in accordance with the manufacturer's recommendations and the surfaces so treated will be protected from both rain and direct sunlight. A membrane-curing compound will not be used on surfaces, which will subsequently be coated with bituminous material of any kind or on surfaces which are required to bond structurally with concrete placed subsequently.
The curing of precast units may be accomplished by their being completely inundated or immersed in water; only fresh water will be used if the units are reinforced.

C.26 Grout
A cementitious pourable mortar suitable for anchoring steel reinforcement shall be used. It shall be free flowing expansion compensated having a very low shrinkage characteristic for various layer thickness ranging at least between 10 mm to 50mm.
The grout shall have a mechanical strength up to at least 70Mpa after 28 days in accordance to EN 12190 and a Tensile Strength in Flexure of at least 9Mpa after 28 days in accordance to EN 196-1. It must be also in accordance with EN 1504-6 (Products and systems for the protection and repair of concrete structures. Definitions, requirements, quality control and evaluation of conformity. Anchoring of reinforcing

C.27 Bonding Agent
Where indicated a bonding agent must be used to provide a good bond between different concrete surfaces. Such bonding agent shall provide an extremely good adhesion to already casted substrates by applying a coat of this bonding agent immediately before the subsequent strata is casted. The bonding agent shall be suitable for saltwater environment and for hot climatic conditions. It must also be non-corrosive and have a great flexibility.
Such product shall be applied on clean, sound and free from any contamination such as oil and grease surfaces. The bonding agent shall be used strictly in accordance with the manufacturer's instructions.

C.28 Concrete Class Designation
Unless otherwise specified, all concrete shall be designed in line with exposure class XS3 which is specifically for areas with potential corrosion induced by chlorides from sea water, such as in tidal, splash and spray zones. As indicated in the table below:

Class designation	Description of the environment
1 No risk of corrosion or attack	
X0	For concrete without reinforcement or embedded metal: all exposures except where there is freeze/thaw, abrasion or chemical attack For concrete with reinforcement or embedded metal: very dry
2 Corrosion induced by carbonation	
XC1	Dry or permanently wet
XC2	Wet, rarely dry
XC3	Moderate humidity
XC4	Cyclic wet and dry
3 Corrosion induced by chlorides	
XD1	Moderate humidity
XD2	Wet, rarely dry
XD3	Cyclic wet and dry
4 Corrosion induced by chlorides from sea water	
XS1	Exposed to airborne salt but not in direct contact with sea water
XS2	Permanently submerged
XS3	Tidal, splash and spray zones
5 Freeze/Thaw Attack	
XF1	Moderate water saturation, without de-icing agent
XF2	Moderate water saturation, with de-icing agent
XF3	High water saturation, without de-icing agents
XF4	High water saturation with de-icing agents or sea water
6 Chemical attack	
XA1	Slightly aggressive chemical environment according to EN 206-1, Table2
XA2	Moderately aggressive chemical environment according to EN 206-1, Table2
XA3	Highly aggressive chemical environment according to EN 206-1, Table2

Table C.1: Exposure classes related to environmental conditions in accordance with EN 206-1

Since that this platform can be accessed by vehicles for loading or unloading, the concrete shall also be in line with Abrasion Class XM1. Such Abrasion Class is adequate for moderate abrasion conditions, such as, vehicles with air tyres, friction of mooring lines and chains and sediments carried by the swell. As indicated in the table below:

Abrasion classes	Conditions	Coefficient values
XM1	Moderate abrasion: - Members of industrial site subjected to the traffic of vehicles with air tyres - Friction of mooring lines or chains - Sediment carried by the swell	K_1 = 5 mm
XM2	Heavy abrasion: - Members of industrial site subjected to the traffic of fork-lift with air or solid rubber tyres - ship hulls along a mooring quay	K_2 = 10 mm
XM3	Extreme abrasion: Members of industrial sites frequented by fork-lifts with elastomer or steel tyres or track vehicles	K_3 = 15 mm

Table C.3: Abrasion classes

D. SUPPLY, LAYING, AND GROUTING OF PRE-CAST CONCRETE ELEMENTS

D.01 General

All beams, slabs, kerbs and other similar things specified or shown on the Drawings to be precast concrete will be cast in strongly proportioned moulds fitted with all requisites for the formation of chamfer, radii, V-grooves, recesses, holes, etc. to produce units perfect in shape, true to dimensions with smooth and true faces and having clearly defined chamfered and radii, also sharp arises on all exposed edges. The provisions of the previous clauses will apply to all precast concrete units required for the Permanent Works, whenever such provisions can be made to apply.

D.02 The Specification covers the supply, delivery, laying and grouting of pre-cast concrete slabs/beams

- The precast elements supplied are to be as indicated on the drawings or stated in the Bill of Quantities.
- The quoted price is to be inclusive of: -
    - Supply and delivery
    - Laying in position
    - Grouting of joints between slabs using a mix approved by the Engineer - in - charge.
- A certificate by a qualified Architect & Civil Engineer assuming responsibility for the workmanship ex-factory is to be enclosed.
- The quantities shown in the Bill of Quantities are only indicative and may be varied according to site measurements.
- Any splintered, defective or cracked slabs shall be rejected.
- It shall be the contractor's liability to take precautions against any damage or injury to the public or his employees. He shall abide by any rules, laws and regulations in force concerning workmen, machinery, vehicles and third parties. The contractor shall be held responsible at law for any injury sustained by any person through contractor's negligence, bad workmanship or faulty machinery.

D.03 Moulding for Precast Concrete

Moulds for cast units will be substantially constructed in steel; the plating will be not less than 5mmthick for units less than 3 metres in length, or 6mm thick for units exceeding this length.
Moulds will be firmly supported on a true and level base and shall be so designed that removal of sides and ends can be carried out without damage to the concrete. The moulds will be sufficiently rigid to prevent bowing or distortion during the casting process, and the joints will be formed so as to prevent leakage of mortar or grout. All holes, rebates, chamfers etc. will be formed by the shuttering, and cutting of these after casting will not be permitted.
Prior to reassemble all mould faces will be cleaned of laitance and other deleterious material and will be coated with a minimum amount of release agent. All moulds will be checked dimensionally, at regular intervals to ensure that concrete units will confirm to the specified tolerances.

D.04 Striking of moulds

Side and end shutters, and any internal shutters not supporting concrete may be struck after 18hours. Faces, which are to receive concrete, will be prepared as specified and following which all faces will be cured.

D.05 Lifting and stacking precast Concrete

No precast concrete unit be lifted until the Contractor is satisfied that the concrete has attained the minimum 7-day strength for its grade, as specified. The units will be stacked on battens in a stacking ground and will remain there until required for setting in position. If units are stacked one of another two battens of equal thickness of not less than 25mm shall be provided for the upper units to rest on.

D.06 Tolerance in manufacture of precast units

Precast units will be manufactured within the following tolerances: -

- Length
    - Up to and including 3 metres + 0 – 06mm
    - Exceeding 3 metres + 0 – 10mm
- Thickness
    - Up to and including 300mm + 3 – 03mm

- Exceeding 300mm + 5 – 05mm

- Permitted deviation from straight line
  - Up to and including 3 metres 03mm
  - Over 3 metres up to 6 metres 06mm
  - Exceeding 6 metres 10mm

- Twist
  - Up to 600 wide and 6 metres length 06mm
  - Otherwise 12mm

- Flatness
  - Maximum deviation from 1500mm
  - Straight edge 06mm
  - Position of inserts + 12 – 12mm
  - Projection of reinforcement + 12 – 12mm

D.07 Records and marking of units
Each unit be clearly marked, on a surface that will be visible when the unit is stacked, with a unique reference number, the type of unit and the date of casting. The contractor will keep records of the locations of the units (whether in yard, stack or incorporated into the Works) together with appropriate dates.

D.08 Inspection of Units
Before stacking, all units will be inspected for damage or defects, and any damage or defective units will be so marked and will be stacked separately from other units.
The contractor may repair such units if he is satisfied that the unit will then be equal in all respects to undamaged units. If he considers that satisfactory repairs cannot be made, the unit will be immediately discarded.

D.09 Projecting reinforcement
Reinforcement intended to project from the unit will not be bent up within the formwork. Reinforcement which is to project from the unit will be accurately placed to the tolerances set out in Clause E.12.

D.10 Cast-in Items
Particular care will be exercised to ensure that cast in items are correctly located and adequately secured to ensure that they are not displaced during casting.

E. FOUNDATION TRENCHES.

E.01 Foundation for Block Work Walls
Foundations of the widths, depths and side slopes indicated on the Drawings, will be excavated for the rubble and mass-concrete foundations of the block work walls.
Making Good Over-Dredging
Over-dredging of the foundation excavation in excess of the tolerance stated in Clause 204 whether in depth, width or length, or any combination of them, will be made good by the Contractor with approved rubble or with concrete of the same quality used in foundation as directed by the Project Manager.

E.02 Rubble Foundations for Blockworks

Mass concrete foundations to the block wall where shown on the Drawings, will be grade C30UW concrete (or as specified in drawings), mixed and deposited as specified herein, and be executed in such convenient lengths, or sections, as may be appropriate. The concrete will be deposited on a firm levelled stratum free from mud, weed, or any other debris, through the voids in the base course blocks such that the insitu concrete and lower block form a continuous foundation.
Prior to this the base course blocks will have been set to the correct line and level on continuous plinths each 500mm wide running along the toe and heel of the blocks. The plinths will be formed in concrete using shutters as required.

E.03 Shuttering for foundation plinths
The end and side boundaries of each mass concrete foundation plinth will be formed by steel or weighted timber formwork well and properly supported and thoroughly secured. The formwork will securely support screeding guiderails carefully adjusted and fixed to the correct levels for the finished surfaces of the foundations and will be truly horizontal.

E.04 Depositing concrete in foundations and infills
The concrete in the foundation and infills will be carefully deposited and evenly spread by divers with as little disturbance as possible being caused by them. The top surface of the plinths will be screeded off with a stiff straight edge reaching across the width of the plinth so that a true surface is formed, corresponding with the tops of the back and front shutters.
Concrete placed as infill between blocks will be brought up to a level not more than 300mm nor less than 200mm below the top of the blocks.

E.05 Inspecting surface of concrete foundations, etc
Each length or section of the foundation plinth thus prepared, will have levels taken thereon and any high places will be dressed down to the correct level.

E.06 Disturbed or Damaged Blocks
Should any blocks or other precast units in the scar-end of the work in progress, or any completed portion of the permanent work be removed, shaken, disturbed or damaged by any cause whatsoever, all such work will be made good by the Contractor.

E.07 Blinding Rubble Backing Surfaces (if applicable)
On the foundation and rubble banks backing to the wharf wall, the Contractor will blind the surfaces from bed level to and including, the top of the bank with broken stone aggregate 40mmto 5mm sizes so that the surfaces present a reasonably even appearance and all surface voids between the rubble stones are filled.

E.08 Foundation (if applicable)
When excavating for the foundation, the contractor will not be permitted to excavate to levels below the toe, or existing dredged level at the existing quay closer than 3m from the toe of the existing quay wall, or such lesser distance as may be agreed following detailed inspection of the junction area.

F. MISCELLANEOUS

F.01 Stainless Steel Fixtures
In order to be considered fit for use in a marine environment, all fixtures including mooring rings are to be made out of Grade 316 stainless steel (Type A4).
The Contractor is to ensure that no stainless-steel fixture is in direct contact with any other ferrous material such as steel. Thus, extra care should be taken to ensure that stainless steel items are held temporary in place using nonferrous elements. If the anchoring system of such stainless-steel fixtures is made of a different ferrous material, adequate isolation materials are to be used between the two elements so as to prevent corrosive deterioration between the two.

F.02 Mooring Rings/Bollard Cleat
All mooring rings/cleats shall be made out of AISI316 stainless steel.
The fittings are to be installed when concrete is still fresh. The Contractor is to liaise with the Contracting Authority and seek approval in advance on the item to be used. The Authority reserves the right not to affect any payments if the product is found to be of an inferior quality.

F.03 Fenders
Mooring fenders shall be D type fenders consisting primely a D shaped rubber bumper with stainless steel fixings. They shall be installed in horizontal manner, running parallel with the concrete deck. The rubber

must have a tensile strength of minimum 1.6 mm^2 and an elongation value of at least 300% in accordance with BS ISO 37:2011. All fender components shall be resistant to salty environments and to UV rays. The Contractor is to liaise with the Contracting Authority and seek approval in advance on the item to be used. The Authority reserves the right not to affect any payments if the product is found to be of an inferior quality.

F.04 Keel Rollers
Rollers shall have a PVC cover and a polypropylene core. They shall be installed in a horizontal manner supported on a stainless-steel roller shaft and assembled on galvanized steel brackets. A proprietary system may be adopted upon presentation of a certification of performance.

General

Q.01 All the works provided as part of the contract shall be inspected and commissioned in accordance with all relevant European Standard Specifications and Codes of Practice to the satisfaction of the Engineer. All installations shall be inspected and tested in sections as the work proceeds and on completion as complete systems and it shall be noted that the Engineer may require inspecting or testing of any equipment during installation.

Q.02 All tests shall be arranged in co-operation with the Engineer and he shall be given prior notice of the time, location and nature of the test. No test shall be considered valid unless the Engineer is present. All necessary skilled and unskilled labour shall be provided for attendance duties before, during and after the test and the test media shall be provided and subsequently disposed of except where otherwise specified.

Q.03 Defects occurring at any time during the test shall be made good and a complete re-test shall be carried out, all at no extra cost. Where failure during a test, inspection or commissioning process results in damage to the building fabric and/or services not provided as part of this contract or requires subsequent builders' work then these items shall be made good at no extra cost.

Q.04 All test points shall be provided which are necessary to carry out the specified tests and commissioning requirements. Such points shall be fitted with removable plugs, flanges or other approved devices.
No section of the works shall be in any way concealed prior to testing and inspection. Subsequent concealment, where applicable, shall only take place following written authority from the Engineer.

Q.05 All necessary facilities, measuring and recording instruments including test pumps and gauges for inspection/testing and commissioning are to be calibrated as necessary before use. The Engineer reserves the right to call for a demonstration of the accuracy of any instrument used.

Q.06 Cleaning and Flushing out of Systems
Prior to setting up the systems, these shall be thoroughly cleaned up and pipes shall be flushed out. Water installations shall be flushed out using cold water at maximum mains pressure. During the cleaning process, the flow shall be interrupted occasionally to dislodge debris and pipe walls rapped. Items which are prone to damage during the cleaning operations shall be isolated or removed and subsequently re-fitted.

Q.07 Commissioning
All systems shall be filled with the working fluid, vented and brought to operating conditions and the flows then regulated to the design values. Following regulation and balancing procedures all plant and systems shall be put into operation and examined to ensure that the installations are operating correctly.

Q.08 Record Drawings
The Contractor shall provide drawings to a scale not less than 1:100. These shall show plans and such sections as the Engineer may consider necessary. Final copies shall consist of two prints of each drawing together with an electronic copy of all the drawings. The final copies of the `As fitted' drawings shall be submitted to the Engineer within one month of the completion of the contract.
The final certificate will not be authorized until the drawings are received by the Engineer to his satisfaction. Metal items will be located so that they are not in contact with the reinforcement and will not be connected to the reinforcement by binding wire or any other means.

D.11 Erection of precast units
No unit will be placed in the works until it has been inspected, and if appropriate repaired, Units will be handled using padded slings, or purpose made lifting holes. Any unit, which is damaged during handling or

erection, may be rejected unless it appears that the damage is so minor that that it will not impair the performance of the unit.
All reinforced precast units will be bedded upon 2:1 sand/cement mortar which shall be placed not more than 15 minutes before the unit is placed. The Contractor may use insert spaces or packers to control the location of the units.
Location of units will be completed satisfactorily while the units are still supported by a crane or other lifting device, movement of units after disconnection from the crane will not be allowed.

D.12 Erection Tolerance for Precast Units
Unless shown otherwise on the Drawings, units will be placed within the following tolerance: -
Plan position in any direction + 10mm – 10mm
Level + 06mm – 06mm

D.13 In-situ Connection
All connections between precast units will be cleaned and blown out before any concrete is placed.

D.14 Manufacturer of precast members off site
Subject to the agreement of the employer the contractor may manufacture precast members off the site.

D.15 Marine Blockworks Walls
Block work walls to conform
All materials and work in the block work walls will comply with the relevant sections of this specification. Should there be a conflict of requirements, the terms of this section on Blockwork Walls shall take precedence.

D.16 Precasting Blocks
The concrete blocks required for the construction of the Permanent Work are shown on the Drawings, and the concrete mix, surface finishes and method of mixing and placing concrete will be as specified herein.

D.17 Blocks not square or honeycombed
Should the sides or ends of any blocks be out of true, in consequence of the bulging of the mould or faulty setting up, all such roundings or inequalities will be dressed off neatly and accurately by masons, so as to produce true and even faces and the required width of joint when the block is set in position. Should honeycombing exist in a slight degree only in the face of any block, it will be stopped neatly and carefully with 2 to 1 cement mortar rubbed in by means of a hand float, fair with the general face of the block. Blocks that are irreparably out of square or badly honeycombed will not be used in the Permanent works.

D.18 Broken or Damaged Blocks
No broken or damaged blocks will be set anywhere in the Permanent works, unless with the written sanction of the Engineer's Representative and then only provided he is informed as to what use the blocks are to be put and that the concrete in them is good and sound.

D.19 Precast Block Setting
The whole of the blocks, and other precast units, for the permanent work will be well and carefully set with close joints and at the levels and with the bond shown, figured and described in or the Contract Documents. Only skilled divers, experienced in underwater block setting, will be employed in setting blocks under water and only competent masons above water. In all cases blocks will be set hard up one to another to make close works.

D.20 Setting foundation course.
Special care will be taken with the setting of the foundation course of the block work. Any irregularities of line or level or high places will be corrected by lifting and re-setting.

METHOD STATEMENT

Section 01: Construction Manual Overview

Purpose

The client intends this manual as a resource for all personnel engaged in contract administration. The manual establishes policies and procedures for the re-construction of a Slipway at Coast Road, Naxxar, Malta.

Scope

The manual covers Construction details and Health & Safety as well as Environmental policies and procedures for the project. Before attempting to apply these instructions and guidelines, the field personnel must have a thorough understanding of the specifications and other contract requirements. The manual contains references to other documents.

Document Control

The AIC is responsible to establish and maintain or update this document. The AIC and client are jointly responsible to ensure that the requirements are communicated to all key personnel involved in the project. The personnel are to be notified of any changes to policies referred to in this Manual or the introduction of new policies for review and approval.

Section 02: Description & Outline of Works Programme

Site Description

The proposed development consists of the demolishing of an existing old slipway and the reconstruction of the slipway, using predominantly precast elements. The existing slipway will be demolished and reconstructed on their original footprint area, while it will also ease the process of loading and unloading operations from the boats. The site is located at Coast Road, Naxxar in the northern part of Malta (as shown in the site plan above) Close to the Maghtab Complex Entrance.

This document presents a construction method statement for the demolition of this existing dilapidated

slipway and reconstruction to modern specifications. The project is being proposed by Transport Malta (TM), as a further effort to improve the existing infrastructure in this area.

These slipways are presently in need of repair, and is exposed to the N, NW and W winds. It has been standing in this original location for many years and have been providing landing facilities for the users in the area ever since. Today it is both used by fisherman and other boat owners who use the slipway to discharge their vessels.

This concrete structure, which seems to have been built in a makeshift fashion, has also been subject to intense wave battering which over decades has damaged and eroded the structure in various parts. The damage coupled with the lack of intervention, over the years has resulted in the current situation. Physical examination of the structure has confirmed that a number of fissures/voids have developed within the concrete structure, below sea level, making it more prone to an accelerated damage by the rigorous wave impact.

Section 03: Construction Method Statement

The construction operations of the slipway are planned to take approximately 90 calendar days to be completed, until they are fully operational. The main entrance and exit for the required construction work on the site will be either from the sea or from land.

It is expected that during re-construction phase, no fishing boats, seaplanes or other fishing equipment will be using this particular slipway. During this period the parking will be reserved only for the required construction vehicles, due to the restrictiveness properties of the site.

All operations are likely to have the least environmental impact in the area. Table 1 outlines the details of the type of machinery which will be present on the site during the entire construction operations for the new slipway. All the below machinery shall be brought on site by sea on barges equipped with an onboard crane:

Quantity	Description
1	Mechanical Backhoe
1	Truck
1	Mechanical Breaker
1	Concrete Mixer

The contractor is also to appoint the following as key experts

Quantity	Personnel
1	Project Manager (Part time)
1	Site Supervisor (Full time)

The Project manager shall have in possession a valid warrant of an architect as awarded by the Periti Warranting Board and the Site supervisor shall have an MQF Level 5 or higher in Building and Construction.

A temporary fence is to be installed along the frontal perimeter access of the site i.e. at the entry point enclosing the slipway down the sea during the entire demolition and construction process as a safety precaution. At the end of each construction day the access gates are to be secured appropriately so that no unauthorized visitors will be able enter into the construction site.

A silt curtain is to be installed around the construction site in the sea to keep any dust and residual material to spread on the seabed.

Signs displaying warnings against trespassing will also have to be fixed around the site area.

<u>Transport Routes</u>

The following access routes for the heavy vehicles during the works on the slipway have been identified, in order to give a better traffic management of the area and also for improved health and safety aspects. The proposed route is as follows:

Inbound <

Vehicular access to the development is allowed from Coast Road. Any access and transportation of material and plant through this access.

Outbound >

Material and plant emerging from the site may be done by sea.

Interventions

The planned initial intervention on this structure is the demolition of the existing damaged slipway structures.
The removal of the existing concrete surface will be done by a small mechanical pneumatic hammer/himac with the resultant concrete debris shall be removed from the ground surface by means of a mechanical shovel. It is expected that this operation will be generating an estimated volume of 100m^3 of concrete wastes. This should take approximately 1 to 2 weeks to complete using a pneumatic hammer, 1 excavator and 1 tipper truck off-site. As soon as the concrete is broken into smaller pieces, the excavator will load this material onto the barge, double handled onto a tipper truck and cart away immediately to an approved dumping site.

It is of utmost importance that no concrete waste will be spilled into the water and during the loading onto the tipper truck. If this happens this must be cleaned at once.

The slipway both consisting for the main part of precast elements will be constructed next, as per method statement in Section 05 below.

Section 04: Method Statement – Construction of Slipway

The following identifies the main disciplines required for the construction of the slipway in the order in which they will be carried out:

Setting out: Once the correct setting out coordinate for the slipways have been established together with the client representatives and/or by the PA Land Surveying Unit, the following activities can take place.

Grabbing and air lifting: Once the footprint (following excavation) of the slipway has been established the grabbing of the existing silt/sand deposit will be carried out utilizing an excavator or crane grabber. The divers will then commence with the air lifting in order to assure that the casting/placing of the blocks is on

solid rock.

Precast concrete blocks shall be placed at the bottom of the ramp to act as a toe for the slipway.

Shims are to be constructed to support the steel beams and lay them to falls to a gradient less than 8^{O}.

These are to be made out of either in-situ concrete or precast concrete blocks.

Steel beams are to be laid out as shown in the drawings. The levels and gradient of these elements is important because the precast slabs will follow the same gradient

In order to form the ramp, in situ concrete is to be poured and properly vibrated.

The precast slab is to be then placed and properly leveled. The ramp is to be formed in sets of 2 slabs at a time.

This rotation is to be repeated for all the slabs, and the last slab is to be leveled with in-situ concrete with the rest of the ramp on ground.

This above procedure is repeated again on the other grids until all seawall/slipway is formed.

All work that will be carried out from dry land, that is, plant will be positioned either on the foreshore itself or on the precast concrete deck spanning from one grid of Dolphins to another. Sea borne equipment may also be used.

Casting of concrete underwater will be carried out in elements around the slipway. The depth used for these elements will depend on the bedrock profiles encountered. All casting underwater shall be carried out using a concrete pump with appropriate protection against segregation/washing of cement.

The new structure will have a slope of 1:8 using precast slabs suitably reinforced to ensure lifting and placing without breaking. The toe of this slipway and the sidewalls is constructed as in paragraphs above.

Section 05: Outline Works Programme

The project will be executed in two distinct phases, namely the precasting of concrete elements off-site, and the installation of these on site in a subsequent stage.

Permanent site works will be commencing as soon as per special conditions, and it is planned that these works will be completed within a 90 calendar day period.

In broad terms the stages of the work will be as follows:

- Mobilization
- Road fencing, fencing to serve as a buffer from the public, setting up of site office andfacilities
- Preparation of the silt curtain in the sea
- Surveying/settingout
- Demolition of existing slipways
- Precastfabrication
- Installation of precastelements
- Casting ofdeck
- Miscellaneous

The Preliminaries Section involves the mobilization of office/skid and facilities, etc. which will start after the award of the contract. During this stage the contractor's compound will be installed and will entail the enclosing of the construction area by means of a fence from land and a silt curtain in the sea. **THIS WILL ENSURE THAT NO MACHINERY, PERSONELL OR BUILDING MATERIAL ENCHREOACH BEYOND THE DELIMITED AREA TO THE DETRIMENT OF THE PROTECTED AREA.** The surveyors' work will also start during this period and will involve setting of stations, checking of existing surveys and setting out of the building including the piled foundations.

Concurrently during this same period, the Contractor will the sourcing/procure the required materials and resources and will commence works on the demolition of the existing structure.

It is expected that the contractor will commit all the necessary workforce/equipment to carry out works on time.

Work will be prioritized as follows and will be completed within a 90 calendar day from date of commencement. Client/Contractor Milestones will be as follows:

Section 06: Dust Mitigation Measures

The following are general environmental management considerations. The appointed Contractor will submit detailed information including technical drawings and literature regarding the manner in which the said considerations shall be put into practice in the real world, once the Works commence.

Dust mitigation: Extraction, transport, storage, and use of dust laden Materials

The contractor will ensure that the transport of dust laden materials to and from the Site and the Contractor's or sub-contractor's plants, or the handling of such material within the Site and in the aforementioned plants shall be carried out in manners through which dust emissions are kept under control.

It is envisaged that during the construction of the foundations the amount of machinery on site will be limited to an excavator, a piling auger as well as one or two tipper trucks to remove the excavated material. During the construction of the building the main equipment on site will be a mobile or small tower crane and trucks and/or platforms for the delivery of the building material. This is not expected to generate a lot of dust/mud as the tipper trucks will not be directly accessing the clayish site and material on tipper trucks will be deposited directly by means of a skip attached to the crane. Notwithstanding the contractor will be cleaning/hosing the road area immediately in front of the site in order to ensure proper site housekeeping and mitigate nuisance to neighbors and pedestrians.

Activities prone to generating substantial amount of dust will be as much as possible avoided during prevailing windy periods, and in times when these can have an impact of surrounding property and/or residents and tourists in the area.

The storage of and handling areas for dust laden materials in locations which preclude sensitive receptors from being affected by dust.

The minimization of materials-handling and of drop heights. If this becomes necessary appropriate propriety chutes, protected by tarpaulins/netting will be used.
The use of appropriate extractors, filters, and and/or scrubbers during generating activities, for instance when power tools are used.

The contractor will ensure that bulk cement shall be transported to contractor's mixing plant in closed containers and stored in closed silos. Sand and fine material shall be transported to contractor' plant in covered vehicles. Areas where concrete is mixed, and the mixing plant and equipment should be of a design that precludes the dispersal of fine dust.

Gaseous and particulates pollution caused by equipment and vehicles

The use of heavy equipment/vehicles can contribute substantially to air pollution mainly through exhaust systems and brake pads. The most effective way in which air pollution from such equipment/vehicles is reduced, would be through the reduction of vehicle use, which would could be achieved through improved standard operations planning, and the use of state-of-the-art equipment/vehicles manufactured by firms which are known to be committed to the production of fuel efficient engines and mechanical systems which use more environmentally friendly materials. The machinery list should confirm that machinery is well maintained and therefore conforming to the above.

The contractor will ensure that Works procedures will be designed in manner that minimizes the use of vehicles and equipment. He will also ensure that both mobile and on-site equipment are of acceptable standards and well-maintained. The AIC/Project Manager shall be authorized to refuse entry to the site of any vehicle appears to be having a significant and negative impact on air quality.

Section 07: Noise Level Monitoring Programme

One way of ensuring that noise is kept to a minimum is conformity to the Motor Vehicle Roadworthiness Test Regulations, 1999 (Legal Notice 126 of 1999), given that the VRT also covers noise generation. The Contractor will authorize the Project Manager to ensure that the Contractor's and sub-contractor's vehicles are VRT certified and refuse entry to and/or use in the Site of any vehicle or outdoor equipment, which is considered to be ill-equipped to minimize noise emissions. All sea vessels are to have the Commercial Vessel Certificate (CVC). The exhaust system from any engine used on site will be fitted with a residual silencer. All plant shall be operated with any relevant doors closed and shall be fitted with silencers and noise suppressors.

In the case of complaints, which could be made during the construction works, the contractor will respond quickly by making adjustments, which may include either or a combination of the following:
The limitation of the period during the working day when the noise generating equipment is used.
The fitting of extra/new silencers to engines.

In the case that the complaints indicate the need for monitoring, the following criteria should be used when determining the significance of the effects of noise generations.

Noise assessments refer to the following standards:

- BS EN5228:1997
- Noise and vibration control on construction and open sites.
- Part 1: 1997 Code of practice for basic information and procedures for noise and vibration control
- Part 2: 1997 Guide to noise and vibration control legislation for construction and demolition, including road construction and maintenance

This Standard encourages the adoption of 'all reasonably practicable means to protect local communities from construction noise and vibration, taking into account local circumstances and available mitigation options.

Such measures include engineering measures, restricted hours of working and the setting of noise limits.

Limits for construction noise are generally specified in terms of absolute day and night-time $L_{Aeq,T}$levels at the site boundary or outside dwellings and may be the subject of prior agreement with public authorities (e.g.PA)

There are no definitive guidelines or criteria for the assessment of construction noise, although upper limits of maximum acceptable noise outside dwellings are often specified on major infrastructure projects.

Typical daytime noise limits of 70 dB $L_{Aeq,12hr}$ for rural, suburban and urban areas away from main road traffic and 75 dB $L_{Aeq,12hr}$ for urban areas near main roads and heavy industrial areas were included in Advisory Leaflet 72 *Noise Control on Building Sites* issued by the British Department of the Environment, together with supplementary advice that indicates evening noise limits should be 10 dB below daytime limits.

On the basis of the above considerations the significance of impacts shall be interpreted as follows:

Insignificant	Difference <3dB	Barely audible
Low significance	Difference ~5dB above background noise levels as indicated in BS4142:1997	Marginal significance
Moderate significance	Difference ~10 dB above background noiselevel as indicated inBS4142:1997	Could give rise to complaints mitigation should beconsidered
High significance	>75 dB(A) as indicated in the DoE Advisory Leaflet 72 *Noise Control on Building Sites*	Requires mitigation

NB:

It should be noted however that perceived significance could be different to measured significance. Different people react in different ways and the quality of the noise could cause different reactions. Many people object to the noise of petards but many others go out of their way to be as near as possible to the site where they are let off. Similarly, most people disregard aircraft but people living close to airports are disturbed by the noise because it happens so frequently.

Reference should also be made to the Planning Policy Guidance 24: Planning and Noise issued by the Department of Communities and Local Government (1994).

Finally, the contractor will select and utilize methods of working, and items of plant, so that the maximum measured ground vibrations do not exceed 70dB at the perimeter of the site shall not exceed, or the value indicated by the relevant Authorities.

Section 08: Access Plan & Traffic Management

Access to site: The access to site for material and plant will be by land or sea. The access to the site itself will be limited to contractors, client and design team.

A fence will be erected at the interface of the site to provide adequate screening and security. The height of the fence will be a minimum of 2.2 m in height and will incorporate a lockable door for the ingress of personnel.

A silt curtain will also be installed from the sea level to seabed. Vertical floating elements are to be installed at the top to cater for spillage when higher waves hit the curtain.

In general, the contractor will observe all rules and regulations regarding the use of public roads and sea.

There should be no need to close off the road during the construction phase as the road is relatively out of way.

A temporary supply for electrical and water supplies shall be installed with the source being provided by the contractor. Portable W.C.'s shall be provided on-site by the contractor.

As small store/ office shall be provided as well as a portable toilet shall be provided and be maintained on a regular basis. The plan is to set these up at the area in front of the site.

Material stores shall also be set-up in the enclosed area reserved for the contractor. These will essentially house all tools to be used by the workers.

Appropriate signage, and road markings and similar devices will be installed (if necessary) to facilitate traffic flow.

The sea/road traffic management measures will be kept under constant supervision.

Section 09: Anti-pollution Mitigation Measures

Pollution Incident Control and Reporting:

The Contractor shall prepare a Contingency Plan for Pollution Incident Control detailing out the procedures and the roles of specific members of his staff in order to limit the spread of pollutants in case of an incident. In the process of doing so the Contractor shall consult with the relevant agencies including the PA, the Civil Protection Department, the relevant Local Councils, and the Police. This Plan shall form part of the above-mentioned Manual of Standard and Contingency Operational Procedures pertaining to the Works.

Copies of this plan shall be circulated to the above agencies and others indicated by the Supervisor. All the staff workers shall be made aware of the procedures and their roles in case of an incident.

The Plan shall be consistent with existing national Emergency Preparedness Plans. This Plan shall cover the following considerations:

- Staff responsibilities
- Procedures regarding the storage, handling, and use of hazardous materials
- Guidelines regarding the degrees of containment regarding specific materials
- Identification of specific locations for the required contingency equipment
- The routes within the site for emergency vehicles. Such routes should be of the required widths and slopes and provide adequately for the turning circles of the vehicles which are likely to be used
- Definitionofcircumstanceswhenstaffarealertedtostopworkingandtaketherolesassignedtothem
- Systems to be adopted to notify emergency services and subsequently to report the incidents, the details of the incident, and the manner in which it was contained

All incidents or ‘near-misses’ shall be reported to the Supervisor within 24 hours of its occurrence. This report shall detail the cause of the incident or ‘near miss’ and proposals to reduce the likeliness of a re-occurrence.

Section 10: Plant Schedules & Certification

For the purposes of ensuring the good working condition of plant to be used on the site the contractor will adopt the following procedure for plant schedules and relative engineer's certificates, where applicable, as described below:

All licensed vehicles will have been tested for roadworthiness before being licensed. Therefore, by default they are generally in good working condition.

The contractor will submit a 'list of plant' which will show the pool of the contractor's plant from which will be selected the items to be used on the site. Every month for the whole duration of the project the contractor will submit to the client a schedule of trucks, trailers and other non-resident plant that will enter the site during the next following week/s. The first such schedule will be submitted during the first week. (Note: For the purposes of this section "non-resident plant" means plant that will not be kept on or near the site after working hours.)

Cranes, pumps or all other equipment used will be covered by an engineer's certificate. On the dates shown in the programme (POW) or at least 2 days prior to entry of any plant items into the site, whichever is the earlier, the contractor will submit a schedule giving the relevant particulars of such plant and the relative engineer's certificate. No such equipment will enter the site unless it is included in the schedule submitted in the preceding week and unless it is covered by the relative engineer's certificate.

The plant schedules will show the registration number, plant type (truck, shovel, etc.), make and model, chassis number, engine number and year of manufacture.

The relative engineer's certificate will have been issued not more than 12 months prior to the use, on any one-day, of the plant on the site.

All plant entering the site will be insured according to the laws of Malta.

Section 11: Temporary Works

The temporary works envisaged at the time of drafting of the CMP are limited to the fencing, services, a small container for storing tools, and a mobile crane. In the event that further temporary works become necessary during the course of the works, the necessary authorities will be consulted at least two weeks before these are carried out.

The following give a brief description of the temporary works:

A fence delimiting the site will be installed for security and safety purposes as explained in the previous sections. A silt curtain will be installed around the site in the sea to limit the spread of pollution.

Site Office – A small fabricated offices with a global area of 20sq m is allowed to be used as a tool store/office. This office will be equipped with electricity, telecommunications, water and sewage. The office will be are equipped with sanitary facilities. Foul and wastewater drains are connected to a temporary waterproof sump. The foul water compartment will be emptied regularly by mobile pumps, which will dump the material in the main sewers.

Section 12: Environmental Measures

General Site Management Practices

The following general site management practices represent the best practice which the contractor will follow during the course of the construction works. The adherence by the contractor to these site work practices will ensure the highest level of environmental measures on this project

The Contractor shall be required to liaise with the relevant authorities/AIC/Client who will be responsible for all environmental issues on site, and who will maintain constant contact with PA.

The site for the excavation works on the terminal will be fenced off. Excavated material shall be covered and properly contained to limit dust propagation, and to reduce the potential for accidental spillage. Any stockpiles of excavated material shall be watered down on a regular basis. Run-off water shall be channeled to settling 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 licensed land-fill sites

The disposal of hazardous waste will be carried out in accordance with procedures approved by the Environment Resources Authority. Any hazardous material shall be notified and shall be transported in accordance with the relevant Regulations. Hazardous wastes include petroleum tank bottom sludges, waste acidic or 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.

Sanitary waste from mobile W.C.s during the construction phase will be disposed of chemically.

Burning of waste plastics and wood on site shall not be allowed.

All activities producing dust shall be controlled, and measures such as spraying with water shall be used to ensure that the emitted dust is minimized. 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.

No use of the public roads will be made, except for the supply of ready mix concrete. For this traffic, the existing wash-down facilities will be available at the exit of the site to minimize any dust carried by construction vehicles on to the public roads. The Contractor has the responsibility of ensuring that trucks are cleaned, and that they do not carry debris, mud or dust into the public roads.

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 BS5228. The Contractor shall select and utilize 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 the boundary of any occupied third-party property.

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. 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 Resources Authority.

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. Disposal procedures shall be as instructed by the appropriate Environment Resources Authority.

Specific procedures in the event of oil or chemical spillage in the sea, indicated by the Environment Resources Authority, shall be adopted by the Contractor. Spillage control kits shall be available in an accessible area on site. Reporting procedures shall also be established.

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.

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 sea. The working area, adjacent to the sea, shall have a raised concrete curb, and shall have reverse grading. The working area shall be drained to a sump located in the area to be levelled off, from where it will be pumped up. The position of the settling ponds and sump may vary as the work proceeds, since it will need to adjust to the stage and level of the excavation; however, approval shall be sought before the installation of any ponds or sump.

The Contractor shall abide strictly with all instructions or guidelines issued by PA, the Traffic Control Board, the Police, and other relevant authorities, in connection with site management, construction traffic, environmental protection, and all other aspects concerning the construction process. For this purpose, all Main Contractors shall be required to have a permanent representative on site, authorized to receive instructions and to act upon them.

Mitigation Measures in the Proposed Development

The measures that will be taken to mitigate any negative effects possibly arising from the proposed development include the following:

Provision of an adequate area for holding any waste that is not inert, pending its removal for treatment elsewhere.

Control of odor emissions will be achieved mainly by the removal of biodegradable/putrescible materials removed regularly.

Dust suppression and control will involve: regular watering of unpaved areas, access roads, fitting enclosures to plant and conveyor belts and ensuring that these are regularly maintained, construction areas and dusty storage piles in dry weather, an 8km/h speed limit imposed for vehicles moving on unpaved areas, using storage bins or hoppers instead of stockpiles, use of tarpaulin in the case of open vehicles, provision of a wheel washing station at the site exit, removal of mud or similar material that is deposited on the public highway.

Noise mitigation measures proposed include fitting of silencers to engines of fixed and mobile site plant and equipment, use of rubber linings on appropriate sections of plant, siting of plant away from sensitive properties or where the natural form of the land will help to provide a buffer, Housing or cladding of plant, use of acoustic screens or amenity mounds, surfacing of internal access roads and plant areas, use of conveyors for on-site transport instead of dump trucks and maintenance of a minimum distance between the workings and any noise sensitive property.

Phasing of works in a manner that is acceptable for the operation of traffic.

Section 13: Oil Spill Combat Plan

The construction of the Slipway entails the use of plant very close to the sea.

By the nature of the works, no pollutant materials, such as liquid chemicals, oils, grease, combustibles etc., will be used for the construction of the Slipway itself. Naturally some amount of fuels and lubricants, required for the usual running of the equipment (land-based equipment), will be required. Nevertheless, in order to minimize the possibility of oil spillage, a number of precautionary and remedial measures would be affected, as describedbelow:

A floating oil boom 20 meters long will be kept on site permanently for the whole of the project. In the event of oil spilling into the sea, the boom would be used to contain the contaminated area. Depending on the magnitude of the spill, the services of the *Civil Protection Department* would be requested.

Other measures will also be implemented depending on the size of the spill. For small leakages on deck and to avoid spillage into the sea, sawdust and sand will be used and maintained. Small spillages into the sea will immediately be treated with absorbent booms and anti-dispersant liquid. This spill combat material will be available on all tugs, pontoons and barges.

Staff responsibilities:

All incidents or 'near-misses' shall be reported to the project Manager, as soon as possible. This report shall detail the cause of the incident or 'near miss' and proposals to reduce the likeliness of a re- occurrence.

Land Based Works:

The contractor will not discharge directly or indirectly or cause or permit, to be discharged into any public sewer, storm water drain, channel, stream-course or sea any trade effluent or foul or contaminated water or cooling or hot water, without the prior written consent of the Engineer.

The store/office, or toilet facilities is erected, foul water effluent shall be directed to a foul sewer or to a sewage tank/ disposal facility either directly or indirectly by means of pumping or other means approved by the Engineer.
Similar measures to those described for marine based works, will be taken to deal with the potential spillages from land-based equipment. All on-site refuelling will be carried out at the furthest point from the shore.

SECTION 4 – SUPPLEMENTARY DOCUMENTATION

4.1 – Draft Contract Form

4.2 – Glossary

4.3 – Specimen Performance Guarantee

These are available to view and download from the 'Resources Section' at: www.etenders.gov.mt

4.4 – General Conditions of Contract

The full set of General Conditions for Works Contracts (Version 4.1), for Supplies Contracts (Version 4.1) and for Services Contracts (Version 4.1) can be viewed/downloaded from the 'Resources Section' at: www.etenders.gov.mt

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.

4.5 – General Rules Governing Tendering

The contents of this procurement document complement the latest version of the General Rules Governing Tenders applicable on the date of the publication of this tender, the Terms of Use and the Manual for Economic Operators applicable to Government's e-Procurement Platform (available from the Resources section of www.etenders.gov.mt).