Rep. 20/2020

WORKS CONTRACT

REF:. SDN 13 – CUP J89D16003130006 – CIG: Z452C78D56

FINANCED FROM THE GENERAL BUDGET OF THE UNION

Between

AICS - Italian Agency for Development Cooperation
Khartoum Office
St. no 33rd Amarat, House no 25 Block 12 K-east
Khartoum, SUDAN

("The contracting authority"),

of the one part,

and

TIHRAGA Engineering for building Company
Official registration number: C/15964
Full official address:Khartoum-Khartoum Nord-Ingaz St_Khatmia
3/1-Sq4 second floor – South Flat
VAT number:449

("the contractor")

of the other part,

have agreed as follows:

PROJECT "Strengthening resilience for refugees, IDPs and host communities in Eastern Sudan – SDN13

CONTRACT TITLE Rehabilitation of Saudi Maternity Hospital - K_05

Identification number SDN 13 – CUP J89D16003130006 – CIG: Z452C78D56 Det. n. 19 del 19/03/2020

Whereas the contracting authority would like the contractor to carry out the following works:

Functional and structural rehabilitation works of Saudi Maternity Hospital (SMH) within Kassala Health Citadel (KHC)

and has accepted a tender by the contractor for the execution and completion of such works and the remedying of any defects therein.

It is hereby agreed as follows:

(1) In this contract, words and expressions shall have the meanings assigned to them in the contractual conditions set out below.

(2) The following documents shall be deemed to form and be read and construed as part of this contract, in the following order of precedence:

(a) the contract,
(b) the special conditions,
(c) the general conditions,
(d) the breakdown of lump-sum price,
(e) the technical and/or performance specifications,
(f) the design documentation (drawings),
(g) any other documents forming part of the contract.

The various documents making up the contract shall be deemed to be mutually explanatory; in cases of ambiguity or divergence, they shall prevail in the order in which they appear above. Addenda shall have the order of precedence of the document they are amending.

(3) In consideration of the payments to be made by the contracting authority to the contractor as hereinafter mentioned, the contractor undertakes to execute and complete the works and remedy defects therein in full compliance with the provisions of the contract.

(4) The contracting authority hereby agrees to pay the contractor in consideration of the execution and completion of the works and remedying of defects therein the amount of:

- Contract price: **EUR 1.047.981,82**

or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the contract. VAT will be paid in compliance with the binding regulations, national law and international agreements concerning the execution of the project. VAT and other taxes shall not be paid on the funds originating from EU funds.

(5) The Parties agree to the set of rights and obligations described in the attached contractual documents, with the following main characteristics, further detailed in the attachments:

			Contract-article:
1	Price	Lump sum contract	49
		Prices can not be revised	48
2	Duration	9 (nine) months implementation of works	34
		Provisional acceptance, after completion of works	60
		Defects liability period up to 90 days, after provisional acceptance	61
		Final acceptance, after expiry of defects liability period	62
3	Delay	0.1% of the contract price for every day of delay	36
4	Supervisor	Arch. Maha Omer Mohamed	5
5	Sub-contracting	Allowed up to 50% of the contract price, with the main Contractor maintaining full responsibility	7
6	Bank guarantees	performance, pre-financing and retention guarantees	15, 46, 47
7	Insurances	For damage to 3rd parties, unlimited for bodily injury	16
		Contractor all risk insurance	16
		Insurance against accidents at work	16
		Insurance for soundness of works	16
8	Payments	lump sum **advance for 10%** of the original contract price, after conclusion of the contract	46
		Interim payment for 20% of the contract price, after completion of 30% of quantities, cf. 49 SC>	49, 50
		Interim payment for 20% of the contract price, after completion of 50% of quantities, cf. 49 SC>	49, 50

		Interim payment for 20% of the contract price, after completion of 75% of quantities, cf. 49 SC>	49, 50
		Interim payment for 20% of the contract price, after completion of 100% of quantities, cf. 49 SC>	49, 50
		Retention money for 10% of the contract price, after signed Final acceptance and final statement of account	47, 49

In witness whereof the parties hereto have signed the contract. This contract shall take effect on the date on which it is signed by the last party, namely the contractor.

Done in English in two originals, one original for the Contracting Authority and one original for the Contractor.

For the contractor

Name: Khalid Ali

Title: General Manager

Signature:

Date: 22/7/2020

For the contracting authority

Name: Vincenzo Racalbuto

Title: Head of AICS Khartoum

Signature:

Date: 22/07/2020

SPECIAL CONDITIONS

SDN 13 – CUP J89D16003130006 – CIG: Z452C78D56

CONTENTS

These conditions amplify and supplement the general conditions governing the contract. Unless the special conditions provide otherwise, the general conditions remain fully applicable. The numbering of the articles of the special conditions is not consecutive but follows the numbering of the general conditions. Other special conditions should be indicated afterwards.

Article 2 Language of the contract

2.1 The language used shall be English.

Article 4 Communication

4.1 All communications during the execution of the works shall be addressed to:

Italian Agency for Development Cooperation – SDN 13 PROGRAM
St. No. 33rd Amarat, House 25 Block 12 K-east, Khartoum, Sudan
Lorenzo Colonna-Preti (civil works project officer)
E-mail: lorenzo.colonnapreti@aics-gov.it
Mobile: +249.9.63161774

4.2 An electronic system will be used by the contracting authority and the contractor for all stages of implementation including, inter alia, management of the contract (amendments and administrative orders), reporting (including reporting on results) and payments. The contractor will be required to register in and use the appropriate electronic exchange system to allow for the e-management of the contract.

The electronic management of the contract through the aforementioned system may commence on the date on which implementation of the contract starts, as described in Article 33 of the general conditions to the contract, or at a later date. In the latter case, the contracting authority will inform the contractor in writing that he will be required to use the electronic system for all communications within a maximum period of 3 months.

Article 5 Supervisor and supervisor's representative

5.2 Under this contract, the Supervisor does not delegate his duties and authority to a Supervisor's Representative

5.4 Administrative orders in the form of Site Instructions shall be solely used by the Supervisor to request from the Contractor a specific intervention on site, either in case of No Compliancy to the Contract technical specifications and/or documentation (correction of mistakes, installation of supplies not approved by the Supervisor, discrepancies as regards to the design) or in case of Variation Order.

Article 9 Access to the site

9.1 The Contractor is obliged to give the Director of AICS Khartoum office and his appointed personnel free access to its sites, factories, workshops, etc., and generally assist the Director or his appointed personnel, like the project Supervisor, in the performance of his duties.

Article 12 General obligations

12.9 The Contractor will comply with its obligation toward visibility. These activities must comply with the rules lay down by AICS and instructions received by the site Supervisor.

Article 15 Performance guarantee

15.1 The amount of the performance guarantee will be 10% of the amount of the contract and any addenda thereto.

15.8 Within 60 days after the deliverance of the certificate of provisional acceptance according to Article 60.1 and the completion of any outstanding work or reservation, 100 % of the amount of the performance guarantee may be released.

Article 16 Liabilities and insurance

16.1 a) By way of derogation from Article 16.1, a) paragraph 2, of the general conditions, compensation for damage to the works resulting from the contractor's liability in respect of the contracting authority is capped at an amount equal to the contract value.

16.1 b) By way of derogation from Article 16.1, b), paragraph 2, of the general conditions, compensation for damage resulting from the contractor's liability in respect of the contracting authority is capped at an amount equal to the contract value.

16.2 a) At the latest together with the return of the countersigned contract, the contractor shall provide the contracting authority and the supervisor with all cover notes and/or certificates of insurance showing that the contractor's obligations relating to insurance are fully respected. The contractor shall submit without delay, whenever the contracting authority or the project manager so requests, an updated version of the cover notes and/or certificates of insurance.

Please refer to Contract Form art.5.

Article 17 Programme of implementation of tasks

17.1 The Contractor shall provide the Supervisor with a simplified programme of implementation of the tasks. This programme shall include at least the order and time limits in which the Contractor proposes to carry out the works, and shall be based on the tranches foreseen in art. 49.1 of the special conditions.

17.2. The Supervisor shall return this document to the Contractor with any relevant remarks within 10 days of receipt, save where the Supervisor, within those 10 days, notifies the Contractor of its wish for a meeting in order to discuss the documents submitted.

Article 21 Exceptional risks

21.4 Potential exceptional weather conditions may be expected in the Summertime from June to September

Article 22 Safety on sites

Without prejudice to art. 22 of General Conditions for works contract, the Contractor is oblige to take all necessary steps to ensure safety on site.

AICS in his capacity of Contracting Authority is determined to foster a safety culture in the workplaces for workers, reasonably following European standards.

In view of the above, in order to support the Contractor, by derogation of art. 22.3 the Contracting Authority has introduced in the BoQs an item concerning safety on building

site in the interests of Contractor employees, agents of the contracting authority and third parties.

The item is a percentage of budget for works and can only be spent for the purpose of ensuring safety by mean of (for instance) lighting, protection, fencing and security equipment which proves necessary for the proper implementation of the tasks or which may be required by the supervisor. The site supervisor will inform and indicate measures to be adopted in general and on case by case basis.

The contractor shall provide the contracting authority and the supervisor with copy of invoices and any other documents showing that the allocated budget has been properly spent.

Article 34 Period of implementation of tasks

34.1 The period of implementation of tasks is 9 (NINE) months maximum

Article 36 Delays in the implementation of tasks

36.1 The rate of liquidated damages for delays in the completion of works shall be 0.1% of the contract price for every day or part thereof which elapses between the end of the period of implementation of tasks and the actual date of completion, up to a maximum amount of 10 % of the contract price or, if the contract is subdivided into phases, 10 % of the price of the phase concerned.

Article 39 Work register

39.1 A work register is required. Practical details to be recorded are mentioned in the General Conditions and shall be agreed upon with the Supervisor at the Commencement of Works.

39.2 For lump sum contracts the statements criteria are based on percentage of works made corresponding to a percentage of global price

Article 40 Origin and quality of works and materials

40.1 All goods purchased under the contract must originate in any eligible source country as defined in SDN13 programme. However, the goods to be purchased may originate from any country, whenever the total price of the estimated quantity of those goods, as reflected in a separate item of the breakdown of the lump-sum price (Volume 4.2.3) is below EUR 100.000. A category of similar goods to be purchased shall not be broken down over more than 1 item of the breakdown of the lump-sum price (Volume 4.2.3)

For these purposes, 'origin' means the place where the goods are mined, grown, produced or manufactured and/or from which services are provided. The origin of the goods must be determined according to the EU Customs Code or the applicable international agreement.

When importing goods, any change in the specified origin must be pointed out to the project supervisor and approved by him.

40.2 The works and the objects, appliances, equipment or materials used in their construction must comply with:
(*) the specifications set out in the Design Documents and BoQ where stated.

40.3 Preliminary technical acceptance will be implemented upon Site Supervisor request and instruction.

Article 43 Ownership of plant and materials

43.2 The equipment, temporary structures, plant and materials on the site shall for the duration of the execution of the works, be vested in the contracting authority.

Article 44: General principles for payments

44.1 Payments shall be made in EURO.

44.2 Invoices shall be submitted to the contracting authority.

44.3 By derogation, pre-financing payment to the Contractor for the lump-sum advance shall be made within 30 days. Other pre-financing payments to the Contractor shall be made within 60 days. Interim payments to the Contractor of the amounts due under each of the interim payment certificates approved by the supervisor shall be made within 60 days, and the final payment to the Contractor of the amounts due after the final statement of account issued by the Supervisor shall be made within 60 days.

Article 46 Pre-financing

46.1 The only pre-financing granted to the contractor, is the lump sum advance referred to in Article 46.1(a).

46.2 The total amount of the pre-financing is 10 % of the original contract price for the lump-sum advance.

46.8 The tranches laid down in Article 49.1 of these special conditions are determined so that the pre-financing is fully repaid before provisional acceptance.

Article 47 Retention monies

47.1 The sum retained to guarantee implementation of the contractor's obligations during the defects liability period is 10 % of the contract price. By derogation to Article 47.1 of the general conditions, that money is not retained from interim payments. The tranches laid down in Article 49.1 of these special conditions are determined so that the retention sum amounts to 10% of the contract price at the moment of the certificate of provisional acceptance.

47.2 By derogation to Article 47.2 of the general conditions, the retention sums cannot be substituted by a retention guarantee.

Article 48 Price revision

48.1 Prices are fixed and shall not be revised.

Article 49 Measurement

49.1 This is a lump sum contract. Under the conditions imposed by the special conditions and general conditions, the amounts due shall be calculated through the following tranches, expressed as percentage of the contract price:

	Percentage	Nature	Timing
1.	**10%**	Lump-sum advance of	After conclusion of the contract

		Article 46.1(a)	
2.	**20%**	Interim payment of Article 50	After completion of 30% of works
3.	**20%**	Interim payment of Article 50	After completion of 50% of works
4.	**20%**	Interim payment of Article 50	After completion of 75% of works
5.	**20%**	Interim payment of Article 50	After completion of 100% of works and issuing of the certificate of provisional acceptance
6.	**10%**	Retention money of Article 47	Within 60 days of the issuing of the signed final statement of account

Article 50 Interim payments

50.7 The interim payments will be paid as determined in Article 49.1 of these special conditions.

Article 53 Delayed payments

53.1 By derogation from Article 53.1 of the general conditions, once the time-limit referred Article 44.3 has expired, the contractor shall be entitled to late-payment interest at the rate and for the period mentioned in the general conditions.

However, when the interest calculated in accordance with the first subparagraph is lower than or equal to EUR 200, it shall be paid to the creditor only upon a demand submitted within two months of receiving late payment

Article 61 Defects liability

61.1 The defects liability period is defined as the period commencing on the date of provisional acceptance, during which the contractor is required to make good any defect in, or damage to, any part of the work which may appear or occur during this period as notify by the supervisor or the contracting authority. The rights and obligations of the parties with regard to this defects liability period are laid down in Article 61 of the general conditions.

61.7 The defects liability period is set equal to 90 days starting from the Provisional Acceptance.

Article 68 Dispute settlement

Any dispute arising out of or relating to this Contract which cannot be settled otherwise shall be referred to the exclusive jurisdiction of the courts of Sudan.

Article 72 Data protection

72.1 Processing of personal data related to the implementation of the contract by the contracting authority takes place in accordance with the national legislation of the

state of the contracting authority and with the provisions of the respective financing agreement.

72.2 To the extent that the contract covers an action financed by the European Union, the Contracting Authority may share communications related to the implementation of the contract, with the European Commission. These exchanges shall be made to the Commission, solely for the purpose of allowing the latter to exercise its rights and obligations under the applicable legislative framework and under the financing agreement with the Partner country – contracting authority. The exchanges may involve transfers of personal data (such as names, contact details, signatures and CVs) of natural persons involved in the implementation of the contract (such as contractors, staff, experts, trainees, subcontractors, insurers, guarantors, auditors and legal counsel). In cases where the contractor is processing personal data in the context of the implementation of the contract, he/she shall accordingly inform the data subjects of the possible transmission of their data to the Commission. When personal data is transmitted to the Commission, the latter processes them in accordance with Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC1 and as detailed in the specific privacy statement published at ePRAG.]

* * *

[1] OJ L 205 of 21.11.2018, p. 39

VOLUME 2

SECTION 2

GENERAL CONDITIONS FOR WORKS CONTRACTS FINANCED BY THE EUROPEAN UNION BUDGET OR THE EUROPEAN DEVELOPMENT FUND (EDF)

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PRELIMINARY PROVISIONS

Article 1 - Definitions

1.1. The definitions of the terms used throughout this general conditions are laid down in the 'Glossary of terms', annex A1a to the practical guide, which forms an integral part of this contract.

1.2. The headings and titles in these general conditions shall not be taken as part thereof or be taken into consideration in the interpretation of the contract.

1.3. Where the context so permits, words in the singular shall be deemed to include the plural and vice versa, and words in the masculine shall be deemed to include the feminine and vice versa.

1.4. Words designating persons or parties shall include firms and companies and any organisation having legal capacity.

Article 2 - Language of the contract

2.1. The language of the contract and of all communications between the contractor, contracting authority and supervisor or their representatives shall be as stated in the special conditions.

Article 3 - Order of precedence of contract documents

3.1. The order of precedence of the contract documents shall be as stated in the contract.

Article 4 - Communications

4.1. Any written communications between the contracting authority and/or the supervisor on the one hand, and the contractor on the other hand, shall state the contract title and identification number and shall be sent by post, cable, telex, facsimile transmission, e-mail or personal delivery, to the appropriate addresses designated by those parties for that purpose in the special conditions.

4.2. If the sender requires evidence of receipt, it shall state such requirement in its communication and shall demand such evidence of receipt whenever there is a deadline for the receipt of the communication. In any event, the sender shall take all the necessary measures to ensure timely receipt of its communication.

4.3. Wherever the contract provides for the giving or issue of any notice, consent, approval, certificate or decision, unless otherwise specified such notice, consent, approval, certificate or decision shall be in writing and the words 'notify', 'consent', 'certify',

'approve' or 'decide' shall be construed accordingly. Any such consent, approval, certificate or decision shall not unreasonably be withheld or delayed.

Article 5 - Supervisor and supervisor's representative

5.1. The supervisor shall carry out the duties specified in the contract. Except as expressly stated in the contract, the supervisor shall not have authority to relieve the contractor of any of its obligations under the contract.

5.2. The supervisor may, from time to time, while retaining ultimate responsibility, delegate to the supervisor's representative any of the duties and authority vested in the supervisor and he may at any time revoke such delegation or replace the representative. Any such delegation, revocation or replacement shall be in writing and shall not take effect until a copy thereof has been delivered to the contractor. The administrative order which determines the duties, authority and identity of the supervisor's representative shall be issued by the supervisor at the moment of the commencement order. The role of the supervisor's representative shall be to supervise and inspect works and to test and examine the materials employed and the quality of workmanship. Under no circumstances will the supervisor's representative be empowered to relieve the contractor of its obligations under the contract or – save where express instructions to that effect are given below or in the contract – order works resulting in an extension of the period of implementation of tasks or additional costs to be paid by the contracting authority or introduce variants in the nature or scale of the works.

5.3. Any communication given by the supervisor's representative to the contractor in accordance with the terms of such delegation shall have the same effect as though it had been given by the supervisor, provided that:

a) any failure on the part of the supervisor's representative to disapprove any work, materials or plant shall not prejudice the authority of the supervisor to disapprove such work, materials or plant and to give the instructions necessary for the rectification thereof;

b) the supervisor shall be at liberty to reverse or vary the contents of such communication.

5.4. Instructions and/or orders issued in writing by the supervisor shall be considered an administrative order. Such orders shall be dated, numbered and entered by the supervisor in a register, and copies thereof delivered by hand, where appropriate, to the contractor's representative.

Article 6 - Assignment

6.1. An assignment shall be valid only if it is a written agreement by which the contractor transfers its contract or part thereof to a third party.

6.2. The contractor shall not, without the prior consent of the contracting authority, assign the contract or any part thereof, or any benefit or interest thereunder, except in the following cases:

a) a charge, in favour of the contractor's bankers, of any monies due or to become due under the contract; or

b) the assignment to the contractor's insurers of the contractor's right to obtain relief against any other person liable in cases where the insurers have discharged the contractor's loss or liability.

6.3. For the purpose of Article 6.2 the approval of an assignment by the contracting authority shall not relieve the contractor of its obligations for the part of the contract already performed or the part not assigned for which the contractor's performance guarantee may be kept.

6.4. If the contractor has assigned its contract without authorization, the contracting authority may, without formal notice thereof, apply as of right the sanction for breach of contract provided for in Article 63 and 64.

6.5. Assignees must satisfy the eligibility criteria applicable for the award of the contract and they cannot fall under the exclusion criteria described in the tender dossier.

6.6. Before giving its approval the contracting authority should receive as needed a performance guarantee which may be requested for the full contract, a pre-financing guarantee and retention guarantee, from the assignees.

Article 7 - Subcontracting

7.1. A subcontract shall be valid only if it is a written agreement by which the contractor entrusts performance of a part of the contract to a third party. Simple plant hire, labour only and supply contracts are not considered or construed 'subcontracts' for the purpose of this article.

7.2. The contractor shall request to the contracting authority the authorisation to subcontract. The request must indicate the elements of the contract to be subcontracted and the identity of the subcontractors.

Within 30 days of receipt of this request, the contracting authority must either extend the delay for a maximum of 15 days or notify the contractor of its decision, stating reasons should he withhold such authorization. If the contracting authority fails to notify its decision within the time limit referred to above, the request is deemed to be approved at the end of the time limit.

7.3. Subcontractors must satisfy the eligibility criteria applicable for the award of the contract. They cannot fall under the exclusion criteria described in the tender dossier and the contractor shall ensure that subcontractors are not subject to EU restrictive measures.

7.4. Subject to Articles 7.6 and 52, no subcontract creates contractual relations between any subcontractor and the contracting authority.

7.5. The contractor shall be responsible for the acts, defaults and negligence of its sub-contractors and their agents or employees, as if they were the acts, defaults or negligence of the contractor, its agents or employees. The approval by the contracting authority of

the sub-contracting of any part of the contract or of the subcontractor to perform any part of the works shall not relieve the contractor of any of its obligations under the contract.

7.6. If a subcontractor has undertaken any continuing obligation for a period exceeding that of the defects liability period under the contract towards the contractor in respect of the work executed or the goods, materials, plant or services supplied by the subcontractor, the contractor shall, at any time after the expiration of the defects liability period, transfer immediately to the contracting authority, at the contracting authority's request and cost, the benefit of such obligation for the unexpired duration thereof. If the contractor fails to effect such a transfer, the said continuing obligation(s) shall be transferred automatically.

7.7. If the contractor enters into a subcontract without approval, the contracting authority may, without formal notice thereof, apply as of right the sanction for breach of contract provided for in Article 63 and 64.

7.8. If a subcontractor is found by the contracting authority or the supervisor to be incompetent in discharging its duties, the contracting authority or the supervisor may request the contractor to forthwith remove the subcontractor from the site and either to provide a subcontractor with qualifications and experience acceptable to the contracting authority as a replacement, or to resume the implementation of the tasks itself.

OBLIGATIONS OF THE CONTRACTING AUTHORITY

Article 8 - Supply of documents

8.1. Save where otherwise provided in the special conditions, within 30 days of the signing of the contract, the supervisor shall provide to the contractor, free of charge, a copy of the drawings prepared for the implementation of tasks as well as two copies of the specifications and other contract documents. The contractor may purchase additional copies of these drawings, specifications and other documents, insofar as they are available. Upon the final acceptance, the contractor shall return to the supervisor all drawings, specifications and other contract documents.

8.2. The contracting authority co-operates with the contractor to provide information that the latter may reasonably request in order to perform the contract.

8.3. Unless it is necessary for the purposes of the contract, the drawings, specifications and other documents provided by the contracting authority shall not be used or communicated to a third party by the contractor without the prior consent of the supervisor.

8.4. The supervisor shall have authority to issue to the contractor administrative orders incorporating such supplementary documents and instructions as shall be necessary for the proper and adequate execution of the works and the remedying of any defects therein.

Article 9 - Access to site

9.1. The contracting authority shall, in due time and in conformity with the progress of the works, place the site and access thereto at the disposal of the contractor in accordance

with the approved programme of implementation of tasks referred to in Article 17. The contractor grants appropriate access to other persons as set out in the special conditions or as instructed.

9.2. Any land procured for the contractor by the contracting authority shall not be used by the contractor for purposes other than the implementation of tasks.

9.3. The contractor shall preserve any facilities placed at its disposal in a good state while it is in occupation and shall, if so required by the contracting authority or the supervisor, restore them to their original state on completion of the contract, taking into account normal wear and tear.

9.4. The contractor shall not be entitled to any payment for improvements resulting from work carried out on its own initiative.

Article 10 - Assistance with local regulations

10.1. The contractor may request the assistance of the contracting authority in obtaining copies of laws, regulations and information on local customs, orders or by-laws of the country in which the works are executed, which may affect the contractor in the performance of its obligations under the contract. The contracting authority may provide the assistance requested to the contractor at the contractor's cost.

10.2. Subject to the provisions of the laws and regulations on foreign labour of the country in which the works are to be executed, the contracting authority provides reasonable assistance to the contractor, at its request, for its application for any visas and permits required by the law of the country in which the works are executed, including work and residence permits, for the personnel whose services the contractor and the contracting Authority consider necessary, as well as residence permits for their families.

Article 11 - Delayed payments to the contractor's staff

11.1. Where there is a delay in the payment to the contractor's employees of wages and salaries owing and of the allowances and contributions laid down by the law of the country in which the works are executed, the contracting authority may give notice to the contractor that within 15 days of the notice the contracting authority intends to pay such wages, salaries, allowances and contributions direct. Should the contractor contest that such payments are due, it shall make representations to the contracting authority with reasons, within the 15 day period. If the contracting authority, having considered such representations, is of the opinion that payment of the wages and salaries should be made, it may pay such wages, salaries, allowances and contributions out of amounts due to the contractor. Failing this, the contracting authority may obtain a contribution under any of the guarantees provided for in these general conditions. Any action taken by the contracting authority under this Article shall not relieve the contractor of its obligations to its employees, except to the extent that any obligation may be satisfied by this action. The contracting authority shall not assume any responsibility towards the contractor's employees by this action.

OBLIGATIONS OF THE CONTRACTOR

Article 12 - General obligations

12.1. The contractor shall, with due care and diligence, design the works to the extent stated in the contract, execute and complete the works in accordance with the contract and with the supervisor instructions, and shall remedy any defects in the works.

12.2. The contractor shall provide all superintendence, personnel, materials, plant, equipment and all other items, of a temporary or permanent nature required in and for such design, execution, completion and remedying of any defects, insofar as specified in, or may be reasonably inferred from the contract.

12.3. The contractor shall take full responsibility for the adequacy, stability and safety of all operations and methods of construction under the contract.

12.4. The contractor shall comply with any administrative orders given to him. Where the contractor considers that the requirements of an administrative order go beyond the authority of the supervisor or of the scope of the contract, the contractor shall give notice, with reasons, to the supervisor. If the contractor fails to notify within the 30 day period after receipt thereof, he shall be barred from so doing. Execution of the administrative order shall not be suspended because of this notice.

12.5. The contractor shall supply, without delay, any information and documents to the contracting authority or the European Commission upon request, regarding the conditions in which the contract is being executed.

12.6. The contractor shall respect and abide by all laws and regulations in force in the country in which the works are executed and shall ensure that its personnel, their dependants, and its local employees also respect and abide by all such laws and regulations. The contractor shall indemnify the contracting authority against any claims and proceedings arising from any infringement by the contractor, its employees and their dependants of such laws and regulations.

12.7. Subject to Article 12.9, the contractor undertakes to treat in the strictest confidence and not make use of or divulge to third parties any information or documents which are linked to the performance of the contract without the prior consent of the contracting authority. The contractor shall continue to be bound by this undertaking after completion of the tasks and shall obtain from each member of its staff the same undertaking. However, use of the contract's reference for marketing or tendering purposes does not require prior approval of the contracting authority, except where the contracting authority declares the contract to be confidential.

12.8. If the contractor acts on behalf of or is a joint venture or consortium of two or more persons, all such persons shall be jointly and severally bound in respect of the obligations under the contract, including any recoverable amount. The person designated by the consortium to act on its behalf for the purposes of this contract shall have the authority to bind the consortium. The composition or the constitution of the joint venture or consortium, including the share distribution between its members, shall not be altered

without the prior consent of the contracting authority. Any alteration of the composition or the constitution of the joint venture or consortium without the prior consent of the contracting authority may result in the termination of the contract.

12.9. Save where the European Commission requests or agrees otherwise, the contractor shall ensure the highest visibility to the financial contribution of the European Union. To ensure such publicity the contractor shall implement among other actions the specific activities described in the special conditions. All measures must comply with the rules in the Communication and Visibility Manual for EU External Actions published by the European Commission.

12.10. Any records must be kept for a 7-year period after the final payment is made under the contract. In case of failure to maintain such the contracting authority may, without formal notice thereof, apply as of right the sanction for breach of contract provided for in Article 63 and 64.

Article 12a - Code of conduct

12a.1 The contractor must at all times act impartially and as a faithful adviser in accordance with the code of conduct of its profession. It shall refrain from making public statements about the project or services without the contracting authority's prior approval. It shall not commit the contracting authority in any way whatsoever without its prior consent and shall make this obligation clear to third parties.

Physical abuse or punishment, or threats of physical abuse, sexual abuse or exploitation, harassment and verbal abuse, as well as other forms of intimidation shall be prohibited. The contractor shall also provide to inform the contracting authority of any breach of ethical standards or code of conduct as set in the present Article. In case the contractor is aware of any violations of the abovementioned standards he shall report in writing within 30 days to the contracting authority.

12a.2 The contractor and its staff shall respect human rights and applicable data protection rules.

12a.3 The contractor shall respect environmental legislation applicable in the country in which the works are executed and internationally agreed core labour standards, i.e. the ILO core labour standards, conventions on freedom of association and collective bargaining, elimination of forced and compulsory labour, elimination of discrimination in respect of employment and occupation, and the abolition of child labour, as well as applicable obligations established by these Conventions:

- Vienna Convention for the protection of the Ozone Layer and its Montreal Protocol on substances that deplete the Ozone Layer;
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention);
- Stockholm Convention on Persistent Organic Pollutants (Stockholm POPs Convention);

- Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (UNEP/FAO) (The PIC Convention) Rotterdam, 10 September 1998, and its 3 regional Protocols.

12a.4 The contractor or any of its sub-contractors, agents or personnel shall not abuse of its entrusted power for private gain. The contractor or any of its sub-contractors, agents or personnel shall not receive or agree to receive from any person or offer or agree to give to any person or procure for any person, gift, gratuity, commission or consideration of any kind as an inducement or reward for performing or refraining from any act relating to the performance of the contract or for showing favour or disfavour to any person in relation to the contract. The contractor shall comply with all applicable laws and regulations and codes relating to anti-bribery and anti-corruption.

12a.5 The payments to the contractor under the contract shall constitute the only income or benefit it may derive in connection with the contract. The contractor and its staff must not exercise any activity or receive any advantage inconsistent with their obligations under the contract.

12a.6 The execution of the contract shall not give rise to unusual commercial expenses. Unusual commercial expenses are commissions not mentioned in the contract or not stemming from a properly concluded contract referring to the contract, commissions not paid in return for any actual and legitimate service, commissions remitted to a tax haven, commissions paid to a recipient who is not clearly identified or commission paid to a company which has every appearance of being a front company. The European Commission may carry out documentary or on-the-spot checks it deems necessary to find evidence in case of suspected unusual commercial expenses.

The respect of the code of conduct set out in the present Article constitutes a contractual obligation. Failure to comply with the code of conduct is always deemed to be a breach of the contract under Article 63 of the General Conditions. In addition, failure to comply with the provision set out in the present Article can be qualified as grave professional misconduct that may lead either to suspension or termination of the contract, without prejudice to the application of administrative sanctions including exclusion from participation in future contract award procedures.

Article 12b - Conflict of Interest

12b.1 The contractor shall take all necessary measures to prevent or end any situation that could compromise the impartial and objective performance of the contract. Such conflict of interests may arise in particular as a result of economic interest, political or national affinity, family or emotional ties, or any other relevant connection or shared interest. Any conflict of interests which may arise during performance of the contract must be notified to the contracting authority without delay. In the event of such conflict, the contractor shall immediately take all necessary steps to resolve it.

12b.2 The contracting authority reserves the right to verify that such measures are adequate and may require additional measures to be taken if necessary. The contractor shall ensure that its staff, including its management, is not placed in a situation which could give rise to conflict of interests. Without prejudice to its obligation under the contract the contractor shall replace, immediately and without compensation from the contracting authority, any member of its staff exposed to such a situation.

12b.3 The contractor shall refrain from any contact which would compromise its independence or that of its personnel.

12b.4 The contractor shall limit its role in connection with the project to the provision of the works described in the contract.

12b.5 The contractor and anyone working under its authority or control in the performance of the contract or on any other activity shall be excluded from access to other EU budget/EDF funds available under the same project. However, if the contractor is able to prove that his involvement in a previous stages of the project does not constitute unfair competition, he may participate, subject to the prior approval of the contracting authority.

Article 13 - Superintendence of the works

13.1. The contractor shall itself superintend the works or shall appoint a representative to do so. Such appointment shall be submitted to the supervisor for approval within 30 days of the signature of the contract. The supervisor shall approve or refuse the appointment within 10 days. The approval may at any time be withdrawn. Should the supervisor refuse the representative appointed within the deadline, or withdraw approval of the appointment, it shall set out the grounds on which its decision is based, and the contractor shall submit an alternative appointment without delay. The address of the contractor's representative shall be deemed to be the address for service given by the contractor.

13.2. If the supervisor withdraws its approval of the contractor's representative, the contractor shall, as soon as is practicable, after receiving notice of such withdrawal, remove the representative from the works and replace it with another representative approved by the supervisor.

13.3. The contractor's representative shall have full authority to make any decision necessary for the execution of the works, to receive and carry out administrative orders and to countersign the work register referred to in Article 39 or attachment, where appropriate. In any event, the contractor shall be responsible for ensuring that the works are carried out satisfactorily including ensuring that the specifications and administrative orders are adhered to by its own employees and by its sub-contractors and their employees.

Article 14 - Staff

14.1. The persons employed by the contractor must be sufficient in number, and permit the optimum use of the human resources of the country in which the works are executed. Such employees must have the skills and experience necessary to ensure due progress and satisfactory execution of the works. The contractor shall immediately replace all employees indicated by the supervisor, in a letter stating reasons, as likely to jeopardize the satisfactory execution of the works.

14.2. The contractor shall make its own arrangements for the engagement of all staff and labour. The rates of remuneration and the general working conditions, as laid down by the law of the country in which the works are executed, shall apply as a minimum to employees on the site.

Article 15 - Performance guarantee

15.1. The contractor shall, together with the return of the countersigned contract, furnish to the contracting authority a guarantee for the full and proper performance of the contract. The amount of the guarantee shall be as specified in the special conditions and shall be in the range of 5 and 10% of the amount of the contract price including any amounts stipulated in addenda to the contract.

15.2. The performance guarantee shall be held against payment to the contracting authority for any loss resulting from the contractor's failure to perform its obligations under the contract.

15.3. The performance guarantee shall be in the format provided for in the contract and may be provided in the form of a bank guarantee, a banker's draft, a certified cheque, a bond provided by an insurance and/or bonding company, an irrevocable letter of credit or a cash deposit made with the contracting authority. If the performance guarantee is to be provided in the form of a bank guarantee, a banker's draft, a certified cheque or a bond, it shall be issued by a bank or bonding and/or insurance company approved by the contracting authority.

15.4. Unless stated otherwise in the special conditions, the performance guarantee shall be denominated in the types and proportions of currencies in which the original contract is payable.

15.5. No payments shall be made in favour of the contractor prior to the provision of the guarantee. The guarantee shall continue to remain valid until the date of the issuing of the signed final statement of account referred to in Article 51.

15.6. During the performance of the contract, if the natural or legal person providing the guarantee (i) is not able or willing to abide by its commitments, (ii) is not authorised to issue guarantees to contracting authorities, or (iii) appears not to be financially reliable, the guarantee shall be replaced. The contracting authority shall give formal notice to the contractor to provide a new guarantee on the same terms as the previous one. Should the contractor fail to provide a new guarantee, the contracting authority may terminate the contract.

15.7. The contracting authority shall demand payment from the guarantee of all sums for which the guarantor is liable under the guarantee due to the contractor's default under the contract, in accordance with the terms of the guarantee and up to the value thereof. The guarantor shall, without delay, pay those sums upon first demand by the contracting authority and the guarantor may not raise any objection for any reason whatsoever. Prior to making any claim under the performance guarantee, the contracting authority shall notify the contractor stating the nature of the default in respect of which the claim is to be made.

15.8. Unless the special conditions provide otherwise, the performance guarantee shall be released within 60 days of the issuing of the signed final statement of account referred to in Article 51, for its total amount except for amounts which are the subject of amicable settlement, conciliation, arbitration or litigation.

Article 16 - Liabilities, insurance and security arrangements

16.1. Liabilities

a) Liability for damage to works

Without prejudice to Article 61 (defects liability) and Article 66 (force majeure), the contractor shall assume (i) full responsibility for maintaining the integrity of the works and (ii) the risk of loss and damage, whatever their cause, until the final acceptance as foreseen in Article 62.

Compensation for damage to the works resulting from the contractor's liability in respect of the contracting authority is capped at an amount equal to one million euros if the contract value is less than or equal to one million euros. If the contract value is greater than one million euros, compensation for damages resulting from the contractor's liability shall be capped to the contract value.

However, compensation for loss or damage resulting from fraud or gross negligence of the contractor, its staff, its subcontractors and any person for which the contractor is answerable, can in no case be capped.

After the final acceptance as foreseen in Article 62, the contractor shall remain responsible for any breach of its obligations under the contract for such period as may be determined by the law governing the contract, or by default for a period of 10 years.

b) Contractor's liability in respect of the contracting authority

At any time, the contractor shall be responsible for and shall indemnify the contracting authority for any damage caused, during the performance of the works, to the contracting authority by the contractor, its staff, its subcontractors and any person for which the contractor is answerable.

Compensation for damage resulting from the contractor's liability in respect of the contracting authority is capped at an amount equal to one million euros if the contract value is less than or equal to one million euros. If the contract value is greater than one million euros, compensation for damages resulting from the contractor's liability shall be capped to the contract value.

However, compensation for loss or damage resulting from the contractor's liability in case of bodily injury, including death, can in no case be capped. The same applies to compensation for any damages of any kind resulting from fraud or gross negligence of the contractor, its staff, its subcontractors and any person for which the contractor is answerable.

c) Contractor's liability in respect of third parties

The contractor shall, at its own expense, indemnify, protect and defend, the contracting authority, its agents and employees, from and against all actions, claims, losses or damage, direct or indirect, of whatever nature (hereinafter 'claim(s)') arising

from any act or omission by the contractor, its staff, its subcontractors and/or any person for which the contractor is answerable, in the performance of the duties.

The contracting authority must notify any third party claim to the contractor as soon as possible after the contracting authority becomes aware of them.

If the contracting authority chooses to challenge and defend itself against the claim(s), the contractor shall bear the reasonable costs of defence incurred by the contracting authority, its agents and employees.

Under these general conditions, the agents and employees of the contracting authority, as well as the contractor's staff, its subcontractors and any person for which the contractor is answerable are considered to be third parties.

The contractor shall treat all claims in close consultation with the contracting authority

Any settlement or agreement settling a claim requires the prior express consent of the contracting authority and the contractor.

16.2. Insurance

a) Insurance – general issues

At the latest together with the return of the countersigned contract, and for the period of implementation of tasks, the contractor shall ensure that itself, its staff, its subcontractors and any person for which the contractor is answerable, are adequately insured with insurance companies recognized on the international insurance market, unless the contracting authority has given its express written consent on a specific insurance company.

At the latest together with the return of the countersigned contract, the contractor shall provide the contracting authority and the supervisor with all cover notes and/or certificates of insurance showing that the contractor's obligations relating to insurance are fully respected. The contractor shall submit without delay, whenever the contracting authority or the project manager so requests, an updated version of the cover notes and/or certificates of insurance.

The contractor shall obtain from the insurers that they commit to personally and directly inform the contracting authority and the supervisor of any event likely to reduce, cancel or alter in any manner whatsoever, that coverage. The insurers shall deliver this information as quickly as possible, and in any event at least thirty (30) days before the reduction, cancellation or alteration of the cover is effective. The contracting authority reserves the right to indemnify the insurer in case the contractor fails to pay the premium, without prejudice to the contracting authority's right to recover the amount of the premium it paid, and to subsequently seek compensation for its possible resulting damage.

Whenever possible, the contractor shall ensure that the subscribed insurance contracts contain a waiver of recourse in favour of the contracting authority and the supervisor, their agents and employees.

The purchase of adequate insurances by the contractor shall in no case exempt it from its statutory and/or contractual liabilities. As a minimum, the insurances listed hereafter shall provide cover up to the minimum contractual liabilities laid down in pursuance of Article 16.1 or minimum statutory liabilities laid down in pursuance of the applicable national legislation, whichever is the highest.

The contractor shall fully bear the consequences of a total or partial lack of coverage, and to the full discharge of the contracting authority and the supervisor.

The contractor shall ensure that its staff, its subcontractors and any person for which the contractor is answerable comply with the same insurance requirements imposed to it under this contract. In case of default of insurance or inadequate insurance of its staff, its subcontractors or any person for which the contractor is answerable, the contractor shall indemnify the contracting authority and the supervisor from all consequences resulting therefrom.

Under its own responsibility and without prejudice to the obligation to take out all insurance covering its obligations under this contract, the contractor shall ensure that all compulsory insurances are subscribed in compliance with the laws and regulations in force in the country in which the works are executed. It shall also ensure that all possible statutory obligations applying to the coverage are complied with.

The contracting authority and the supervisor shall not bear any liability for the assessment and adequacy of insurance policies taken out by the contractor with their contractual and/or statutory obligations.

b) Insurance – Specific issues

1. *Insurance for damage to third parties*

The contractor shall take out a civil liability insurance covering bodily injury and property damage that may be caused to third parties by reason of the execution of the works, as well as during the defects liability period. The insurance policy must specify that the contracting authority's and the supervisor's staff, as well as that of other contractors and third parties located on site are considered third parties under this insurance, which shall be unlimited for bodily injury.

2. *Works insurance*

The contractor shall take out a 'Contractor All Risk' insurance to the joint benefit of itself, its subcontractors, the contracting authority and the supervisor.

This insurance shall cover all damage to which the works included in the contract may be subject, including damage due to a defect or a design flaw of the plans, the building materials or the implementation for which the contractor is responsible under the contract and the damages due to natural events. This insurance shall also cover damage to existing goods and properties of the contracting authority and of the supervisor.

This insurance shall also cover the equipment and the temporary works on the site up to their total value of reconstruction/replacement.

3. *Motor insurance*

The contractor shall take out insurance covering all vehicles used by the contractor or its subcontractors (whether they own them or not) in connection with the contract.

4. *Insurance against accidents at work*

The contractor shall take out insurance policies providing coverage of the contractor itself, its staff, its subcontractors and any person for which the contractor is answerable, in case of an accident at work or on the way to work. It shall ensure that its subcontractors do the same. It indemnifies the contracting authority against any claims that its employees or those of its subcontractors could have in this regard. For its permanent expatriate staff, where appropriate, the contractor shall in addition comply with the laws and regulations applicable in the country of origin.

5. *Insurance of liability related to the soundness of the works*

The contractor shall take out insurance covering in full its liability that may be triggered with regard to the soundness of the works even after final acceptance, as foreseen by the law of the country in which the works are executed.

16.3. The contractor shall put in place security measures for its staff commensurate with the physical danger possibly facing them in the country in which they work. The contractor shall be responsible for monitoring the level of physical risk to which its staff are exposed and for keeping the contracting authority informed of the situation. If the contracting authority or the contractor becomes aware of an imminent threat to the life or health of any of the contractor's staff, the contractor must take immediate emergency action to remove the individuals concerned to safety. If the contractor takes such action, he must communicate this immediately to the supervisor.

Article 17 - Programme of implementation of tasks

17.1. Notwithstanding any work programme submitted as part of its tender, the contractor shall provide the supervisor with a programme of implementation of tasks, broken down by activity and by month within 30 days of the signature of the contract. This programme includes at least the following information:

a) the order and time limits within which the contractor proposes to carry out the works;

b) the time limits within which submission and approval of the drawings are required;

c) an organisation chart containing the names, qualifications and curricula vitae of the staff responsible for the site,

d) a general description of the method including the sequence, by month and by nature, which the contractor proposes to carry out the works;

e) a plan for the setting out and organisation of the site, and

f) such further details and information as the supervisor may reasonably require.

17.2. The supervisor shall return these documents to the contractor with its approval or any relevant remarks within ten days of receipt, save where the supervisor, within those ten days, notifies the contractor of its wish for a meeting in order to discuss the documents submitted.

17.3. If the supervisor fails to notify its decision or remarks or wish for a meeting within these 10 days, the programme submitted is deemed approved.

17.4. The approval of the programme by the supervisor shall not relieve the contractor from any of its obligations under the contract.

17.5. No material alteration to the programme shall be made without the approval of the supervisor. If, however, the progress of the works does not conform to the programme, the supervisor may instruct the contractor to submit a revised programme in accordance with the procedure laid down in Article 17.

Article 18 - Detailed breakdown of prices

18.1. If not provided in its tender and where necessary for the purposes of the contract, the contractor shall provide a detailed breakdown of its rates and prices within no more than 20 days following the supervisor's reasoned request.

18.2. Within 30 days of notification of the award of contract, the contractor shall provide to the supervisor for its information only, a detailed cash flow estimate, in quarterly periods, of all payments which may be due to the contractor under the contract. The contractor shall subsequently supply revised cash flow estimates at quarterly intervals, if so required by the supervisor. The communication shall not impose any liability whatsoever on the contracting authority or the supervisor.

Article 19 - Contractor's drawings and execution studies

19.1. The contractor shall submit to the supervisor for approval at its own expense, all design and construction drawings and other documents and objects necessary for the proper execution of the contract, and in particular:

a) drawings, documents, samples and/or models as may be specified in the contract within the time limits and procedures laid down therein or in the programme of implementation of tasks;

b) drawings as the supervisor may reasonably require for the implementation of tasks.

c) plans, drawings and calculations needed to provide evidence of the stability and resistance of the structures, including foundation design and detailed reinforcement plan. These calculations and surveys should be sustained by sufficient site investigations and should be submitted in triplicate to the supervisor for approval at least 30 days before commencing construction of the works in question.

19.2. The supervisor shall return to the contractor the drawings, documents, samples, models, design calculations, objects and other documents required under Article 19.1 with either its endorsement or its remarks within the time limits referred to in the contract or the approved programme of implementation of tasks or, if no time limit is specified, within 15 days of receipt. In the light of the complexity or the number of documents submitted for approval, if the supervisor cannot send its endorsement or its remarks within the time limit mentioned above, the supervisor shall send within 15 days of receipt a holding reply, indicating another time limit by which it will send its endorsement or its remarks, taking into account the relative urgency and complexity of the matter.

If the supervisor fails to notify its endorsement, remarks or holding reply within the time limits referred above, the drawings, documents, samples, models, design calculations, objects and other documents submitted to the supervisor according to Article 19.1 shall be deemed to be approved at the end of the time limits specified above.

19.3. Approved drawings, documents, samples and models shall be signed or otherwise identified by the supervisor and shall not be departed from except as otherwise instructed by the supervisor. Any contractor's drawings, documents, samples or models which the supervisor refuses to approve, shall be modified to meet the requirements of the supervisor and resubmitted by the contractor for approval. Within 15 days of being notified of the supervisor's remarks, the contractor shall make the requisite corrections, adjustments etc. to the documents, drawings, design calculations etc. The corrected or adjusted documents, drawings, design calculations etc. shall be resubmitted for the supervisor's approval under the same procedure.

19.4. The contractor shall supply additional copies of approved drawings in the form and number stated in the contract or in subsequent administrative orders.

19.5. The approval of any drawings, documents, samples or models by the supervisor shall not relieve the contractor from any of its obligations under the contract.

19.6. The supervisor shall have the right at all reasonable times to inspect all drawings, documents, samples or models relating to the contract at the contractor's premises.

19.7. Before provisional acceptance of the works, the contractor shall supply operation and maintenance manuals together with drawings to the contracting authority, which shall be in such detail as will enable the contracting authority to operate, maintain, adjust and repair all parts of the works. Unless otherwise stated in the special conditions, the manuals and drawings shall be in the language of the contract. The works shall not be considered to be completed for the purpose of provisional acceptance until such manuals and drawings have been supplied to the contracting authority.

Article 20 - Sufficiency of tender prices

20.1. Subject to any additional provisions which may be laid down in the special conditions, the contractor shall be deemed to have inspected and examined the site and its surroundings and to have satisfied itself before submitting its tender, as to the nature of the ground and sub-soil, and to have taken into account the form and nature of the site, the extent and nature of the work and materials necessary for the completion of the works, the means of communication with and access to the site, the accommodation it may require and in general to have obtained for itself all necessary information as to risks, contingencies and all other circumstances influencing or affecting its tender.

20.2. The contractor shall be deemed to have satisfied itself before submitting its tender as to the correctness and sufficiency of the tender and of the rates and prices stated in the bill of quantities or price schedule which shall, except in so far as it is otherwise provided in the contract, cover all its obligations under the contract.

20.3. Since the contractor is deemed to have determined its prices on the basis of its own calculations, operations and estimates, it shall carry out without additional charge any work which is the subject of any item whatsoever in its tender for which it neither indicates a unit price nor a lump sum.

Article 21 - Exceptional risks

21.1. If during the execution of the works the contractor encounters artificial obstructions or physical conditions which could not reasonably have been foreseen by an experienced contractor, and if the contractor is of the opinion that additional costs will be incurred and/or an extension of the period of implementation of tasks will be necessary as a result of this, it shall give notice to the supervisor in accordance with Articles 35 and/or 55. The contractor shall specify in such notice the artificial obstructions and/or physical conditions, giving details of the anticipated effects thereof, the measures it is taking or intends to take and the extent of the anticipated delay in or interference with the execution of the works.

21.2. Following receipt of the notice, the supervisor may inter alia:

a) require the contractor to provide an estimate of the cost of the measures it is taking or intends to take;

b) approve measures referred to in Article 21.2 (a) with or without modification;

c) give written instructions as to how the artificial obstructions or physical conditions are to be dealt with;

d) order an amendment to, a suspension, or termination of the contract.

21.3. To the extent that the supervisor decides that the whole or part of the said artificial obstructions or physical conditions could not reasonably have been foreseen by an experienced contractor, the supervisor shall:

a) take into account any delay suffered by the contractor as a result of such obstructions or conditions in determining any extension of the period of implementation of tasks to which the contractor is entitled under Article 35; and/or

b) in case of artificial obstructions or physical conditions other than weather conditions, determine additional payments due to the contractor in accordance with Article 55.

21.4. Weather conditions shall not entitle the contractor to claims under Article 55.

21.5. If the supervisor decides that the artificial obstructions or physical conditions could, in whole or in part, have been reasonably foreseen by an experienced contractor, he shall so inform the contractor as soon as practicable.

Article 22 - Safety on sites

22.1. The contractor shall have the right to forbid access to the site to any person not involved in the performance of the contract, with the exception of persons authorised by the supervisor or the contracting authority.

22.2. The contractor shall ensure the safety on sites during the whole period of execution and shall be responsible for taking the necessary steps, in the interests of its employees, agents of the contracting authority and third parties, to prevent any loss or accident which may result from carrying out the works.

22.3. The contractor shall take all essential steps, on its own responsibility and at its expense, to ensure that existing structures and installations are protected, preserved and maintained. It shall be responsible for providing and maintaining at its expense all lighting, protection, fencing and security equipment which proves necessary for the proper implementation of the tasks or which may reasonably be required by the supervisor.

22.4. If, during the implementation of the tasks, urgent measures are necessary to obviate any risk of accident or damage or to ensure security following any accident or damage, the supervisor shall give formal notice to the contractor to do what is necessary. If the contractor is unwilling or unable to undertake the necessary measures, the supervisor may carry out the work at the expense of the contractor to the extent that the contractor is liable.

Article 23 - Safeguarding adjacent properties

23.1. On its own responsibility and at its expense, the contractor shall take all the precautions required by good construction practice and by the prevailing circumstances to safeguard adjacent properties and avoid causing any abnormal disturbance therein.

23.2. The contractor shall indemnify the contracting authority against the financial consequences of all claims by neighbouring landowners or residents to the extent that the contractor is liable and to the extent that the damage to adjacent properties is not the

result of a hazard created through the design or method of construction imposed by the contracting authority or the supervisor upon the contractor.

Article 24 - Interference with traffic

24.1. The contractor shall ensure that the works and installations do not cause damage to, or obstruct traffic on, communication links such as roads, railways, waterways and airports, save as permitted under the special conditions. It shall, in particular, take account of weight restrictions when selecting routes and vehicles.

24.2. Any special measures which the contractor considers necessary or which are specified in the special conditions or which are required by the contracting authority in order to protect or strengthen sections of roads, tracks or bridges, shall be at the expense of the contractor, whether or not they are carried out by the contractor. The contractor shall inform the supervisor of any special measures it intends to take before carrying them out. The repair of any damage caused to roads, tracks or bridges by the transport of materials, plant or equipment shall be at the expense of the contractor.

Article 25 - Cables and conduits

25.1. Where, in the course of carrying out the works, the contractor encounters bench-marks indicating the course of underground cables, conduits and installations, it shall keep such bench-marks in position or replace them, should execution of the works have necessitated their temporary removal. Such related operations require the authorisation of the supervisor.

25.2. The contractor shall be responsible for the preservation, removal and replacement, as the case may be, of the cables, conduits and installations specified by the contracting authority in the contract and for the cost thereof.

25.3. Where the presence of cables, conduits and installations has not been specified in the contract but is revealed by bench-marks and references, the contractor shall be under a general duty of care and similar obligations regarding preservation, removal and replacement to those set out above. In this case, the contracting authority shall compensate it for expenditure, to the extent that such work is necessary for the execution of the contract.

25.4. However, the obligations to remove and replace cables, conduits and installations and the expenditure resulting therefrom shall not be the responsibility of the contractor if the contracting authority decides to accept that responsibility. The same shall apply where this obligation and the expenditure resulting therefrom devolve upon another specialist administration or an agent.

25.5. When any work on the site is likely to cause disturbances in or damage to a public utility service, the contractor shall immediately inform the supervisor in writing, giving a reasonable period of notice so that suitable measures may be taken in time to allow work to continue normally.

Article 26 - Setting-out

26.1. The contractor shall be responsible for:

a) the accurate setting-out of the works in relation to original marks, lines and levels of reference given by the supervisor;

b) the correctness, of the position, levels, dimensions and alignment of all parts of the works; and

c) the provision of all necessary instruments, appliances and labour in connection with the foregoing responsibilities.

26.2. If, at any time during the execution of the works, any error appears in the position, levels, dimensions or alignment of any part of the works, the contractor, shall, if the supervisor so requires, at the contractor's cost, rectify such error to the satisfaction of the supervisor, unless such error is based on incorrect data supplied by the supervisor which an experienced contractor exercising due care would not have discovered, in which case the contracting authority shall be responsible for the cost of rectification.

26.3. The checking of any setting-out or of any line or level by the supervisor shall not in any way relieve the contractor of its responsibility for the accuracy thereof and the contractor shall carefully protect and preserve all bench-marks, sight-rails, pegs and other items used in setting-out the works.

Article 27 - Demolished materials

27.1. Where the contract includes demolition work, materials and articles obtained therefrom shall, unless the special conditions and /or the law of the country in which the works are executed otherwise provide and subject to the provisions of Article 28, become the property of the contractor.

27.2. Should the special conditions reserve to the contracting authority the right of ownership of materials or all or part of the articles obtained from the demolition work, the contractor shall take all the necessary precautions to ensure that these are preserved. It shall be liable for any destruction of, or damage to, such materials or articles caused by it or its agents.

27.3. Irrespective of the use to which the contracting authority intends to put the materials or articles, in respect of which it reserves the right of ownership, all costs incurred in transporting and storing them and all warehouse charges at the place indicated by the supervisor shall be borne by the contractor for any carriage not exceeding 1000 meters.

27.4. Save where the special conditions provide otherwise, the contractor shall, at its expense, progressively remove rubble and other demolition materials, rubbish and debris from the site.

Article 28 - Discoveries

28.1. Discoveries of any interest whatsoever made during excavation or demolition work shall be brought immediately to the attention of the supervisor. The supervisor shall decide

how such discoveries are to be dealt with, taking due account of the law of the country in which the works are executed.

28.2. The contracting authority reserves the right of ownership of materials found during the excavation and demolition work carried out on land belonging to it, subject to compensating the contractor for any special efforts.

28.3. Artefacts, antiquities and natural, numismatic, or other objects which are of scientific interest, and also rare objects or objects made of precious metals found during excavation or demolition work shall be the property of the contracting authority.

28.4. In the event of disagreements, the contracting authority shall have sole authority to decide as to the qualifications set out in Articles 28.1 and 28.3.

Article 29 - Temporary works

29.1. The contractor shall carry out at its expense all the temporary works to enable the works to be carried out. The contractor shall submit to the supervisor the drawings for temporary works which the contractor intends to use, such as cofferdams, scaffolding, trusses and shuttering. The contractor shall take into account any observations made by the supervisor while assuming responsibility for these drawings.

29.2. Where the design of particular temporary works is specified in the special conditions to be the responsibility of the contracting authority, the supervisor shall provide the contractor with all drawings necessary in reasonable time to enable the contractor to undertake the temporary works in accordance with its programme. In such cases, the contracting authority shall be solely responsible for the safety and adequacy of the design. However, the contractor shall be responsible for the proper construction.

Article 30 - Soil studies

30.1. Subject to the special conditions and to the technical specifications, the contractor shall make available to the supervisor, the personnel and equipment necessary for carrying out any soil survey which the supervisor considers reasonably necessary. The contractor shall be compensated for the actual cost of the manpower and equipment used or made available in such work, plus a reasonable profit, if not already provided for in the contract.

Article 31 - Overlapping contracts

31.1. The contractor shall, in accordance with the requirements of the supervisor, afford all reasonable opportunities for carrying out their work to any other contractors employed by the contracting authority and their workmen, to the workmen of the contracting authority and of any other public authorities who may be employed on or near the site in the execution of any work not included in the contract, or of any contract which the contracting authority may enter into in connection with, or ancillary to, the works.

31.2. If, however, the contractor, on the written request of the supervisor, makes available to any such contractor, or public authority, or to the contracting authority, any roads or ways

for the maintenance of which the contractor is responsible, or permits the use by any such other persons of the contractor's temporary works, scaffolding or other equipment on the site, or provides any other service of whatsoever nature, which was not provided for in the contract, the contracting authority shall pay to the contractor in respect of such use or service, such sums and/or grant such extension of time, as shall, in the opinion of the supervisor, be reasonable.

31.3. The contractor shall not by reason of Article 31 be relieved of any of its obligations under the contract nor shall it be entitled to any claims other than those provided for in Article 31.2.

31.4. In no circumstances may difficulties arising with regard to one contract entitle the contractor to modify or delay implementation of other contracts. Similarly, the contracting authority may not take advantage of such difficulties to suspend payments due under another contract.

Article 32 - Patents and licenses

32.1. Save where otherwise provided in the special conditions, the contractor shall indemnify and hold the contracting authority and the supervisor harmless for all damages and cost incurred due to any claim brought by any third party including creators and intermediaries for any alleged or actual violations of intellectual, industrial or other property rights of any kind whatsoever based on the contracting authority's use as specified in the contract of patents, licenses, drawings, designs, models, or brand or trademarks, except where such infringement results from compliance with the design or specification provided by the contracting authority and/or the supervisor.

32.2. All industrial, intellectual and other property rights (including but not limited to patent rights and copyright) developed in connection with the tasks by or on behalf of the contractor, including but not limited to any rights in any documents prepared for the purpose of the contract or the tasks, shall remain vested in the contractor but the contracting authority shall have an irrevocable, royalty-free, non-exclusive licence of the above-mentioned rights for the purpose of the contract.

Such licence shall carry the right to grant sub-licences and shall be transferable by the contracting authority to third parties without the consent of the contractor being required.

All industrial, intellectual and other property rights (including but not limited to patent rights and copyright) developed in connection with the tasks by or on behalf of the contracting authority, including but not limited to any rights in any documents prepared for the purpose of the contract or the tasks, shall remain vested in the contracting authority but the contractor shall have the right at its cost to copy, use and obtain communication of these documents for the purpose of the contract.

Upon and notwithstanding any termination of the contract howsoever arising, as well as after completion of the tasks, the contracting authority shall continue to have the benefit of the licence referred to in Article 32.2, first paragraph.

IMPLEMENTATION OF THE TASKS AND DELAYS

Article 33 - Commencement orders

33.1. The supervisor issues an administrative order notifying the contractor of the date on which the period of implementation of tasks must start.

33.2. Save where the parties agree otherwise, the period of implementation of tasks shall not start before:

a) in conformity with Article 9, the site, or part of the site has been placed at the disposal of the contractor according to the progress of the work set out in the programme of implementation of tasks approved by the supervisor;

b) the documents mentioned under Article 8.1 have been provided to the contractor.

33.3. Save where the parties agree otherwise, the period of implementation of tasks shall start no later than 180 days following notification of award of the contract.

Article 34 - Period of implementation of tasks

34.1. The period of implementation of tasks shall be as laid down in the special conditions, without prejudice to extensions of the period which may be granted under Article 35.

34.2. If provision is made for distinct periods of implementation of tasks for separate lots, in cases where one contractor is awarded more than one lot per contract, the periods of implementation of tasks for the separate lots will not be accumulated.

Article 35 - Extension of the period of implementation of tasks

35.1. The contractor may request an extension to the period of implementation of tasks if it is or will be delayed in completing the contract by any of the following reasons:

a) exceptional weather conditions in the country in which the works are executed which may affect the implementation of the tasks;

b) artificial obstructions or physical conditions which could not reasonably have been foreseen by an experienced contractor;

c) administrative orders affecting the date of completion other than those arising from the contractor's default;

d) failure of the contracting authority to fulfil its obligations under the contract;

e) any suspension of the works which is not due to the contractor's default;

f) force majeure;

g) any other causes referred to in these general conditions which are not due to the contractor's default.

35.2. If the contractor considers itself to be entitled to any extension of the period of implementation under the contract, the contractor shall:

a) give notice to the supervisor of its intention to make such a request no later than 15 days after the contractor became aware, or should have become aware of the event or circumstance giving rise to the request.

If the contractor fails to give notice of a request for extension of the period of implementation within such period of 15 days, the period of implementation shall not be extended and the contracting authority shall be discharged from all liability in connection with the request; and

b) submit to the supervisor full and detailed particulars of the request, within 30 days from the above notification unless otherwise agreed between the contractor and the supervisor, in order that such request may be investigated.

35.3. Within 30 days from receipt of the contractor's detailed particulars of the request, the supervisor shall, by notice to the contractor after due consultation with the contracting authority and, where appropriate, the contractor, grant such extension of the period of implementation as may be justified, either prospectively or retrospectively, or inform the contractor that it is not entitled to an extension.

Article 36 - Delays in implementation of the tasks

36.1. If the contractor fails to complete the works within the time period(s) specified in the contract, the contracting authority shall, without formal notice and without prejudice to its other remedies under the contract be entitled to liquidated damages for every day or part thereof which shall elapse between the end of the period specified for implementation of tasks or extended period of implementation of tasks under Article 35 and the actual date of completion, at the rate and up to the maximum amount specified in the special conditions.

If the works have been the subject of partial acceptance in accordance with Article 59, the liquidated damages specified in the special conditions may be reduced in the proportion which the value of the accepted part bears to the value of the whole of the works.

36.2. If the contracting authority has become entitled to the maximum claim under Article 36.1 it may, after giving notice to the contractor:

a) seize the performance guarantee; and/or

b) terminate the contract; and/or

c) enter into a contract with a third party at the contractor's cost for the provision of the balance of the works.

Article 37 - Amendments

37.1. Contract amendments must be formalised by a contract addendum signed by both parties or by an administrative order issued by the supervisor except if the amendments result from the application of the contract.

37.2. The supervisor shall have the power to order any amendment to any part of the works necessary for the proper completion and/or functioning of the works. Such amendments by administrative order may include additions, omissions, substitutions, changes in quality, quantity, form, character, kind, position, dimension, level or line and changes in the specified sequence, method or timing of execution of the works. No administrative order shall have the effect of invalidating the contract, but the financial effect, if any, of all such amendments shall be valued in accordance with Articles 37.5 and 37.7.

37.3. All administrative orders shall be issued in writing, it being understood that:

a) if, for any reason, the supervisor finds it necessary to give an order orally, it shall as soon as possible thereafter confirm the order by an administrative order;

b) if the contractor confirms in writing an oral order given for the purpose of Article 37.3 (a) and the confirmation is not contradicted in writing forthwith by the supervisor, the supervisor shall be deemed to have issued an administrative order;

c) no administrative order is required to increase or decrease the quantity of any work where such increase or decrease is the result of the quantity exceeding or being less than that stated in the bill of quantities or price schedule, as the result of measurement laid down in Article 49.

37.4. Save as provided by Article 37.3 prior to issuing an administrative order, the supervisor shall notify the contractor of the nature and form of such amendment. The contractor shall then, without delay, submit to the supervisor a written proposal containing:

a) a description of the tasks to be implemented or the measures to be taken and a programme for execution;

b) any necessary amendments to the programme of implementation of tasks or to any of the contractor's obligations resulting from this contract; and

c) any adjustment to the contract price in accordance with the rules set out in Article 37.

37.5. Following the receipt of the contractor's submission referred to in Article 37.4, the supervisor shall, after due consultation with the contracting authority and, where appropriate, the contractor, decide without delay whether or not to accept the amendment. If the supervisor accepts the amendment, it shall notify the contractor through an administrative order stating that the contractor shall carry out the amendment at the prices and under the conditions given in the contractor's submission referred to in Article 37.4 or as modified by the supervisor in accordance with Article 37.6.

37.6. The supervisor shall, for all amendments ordered by it in accordance with Article 37.3 and 37.5, ascertain the prices in accordance with the following principles:

a) where work is of similar character and executed under similar conditions as work priced in the bill of quantities or price schedule, it shall be valued at such rates and prices contained therein;

b) where work is not of a similar character or is not executed under similar conditions, the rates and prices in the contract shall be used as the basis for valuation as far as is reasonable, failing which the supervisor shall make a fair valuation;

c) if the nature or amount of any amendment relative to the nature or amount of the whole contract or to any part thereof is such that, in the opinion of the supervisor, any rate or price contained in the contract for any item of work is, by reason of such amendment, rendered unreasonable, the supervisor shall fix such rate or price as he thinks reasonable and proper in the circumstances;

d) where an amendment is required by a default or breach of contract by the contractor, any additional cost attributable to such amendment shall be borne by the contractor.

37.7. On receipt of the administrative order, the contractor shall carry out the requested amendment according to the following principles:

a) The contractor will be bound by these general conditions as if the amendment requested by administrative order were stated in the contract.

b) The contractor shall not delay the execution of the administrative order pending the granting of any extension of time for completion or adjustment to the contract price.

c) Where the administrative order precedes the adjustment to the contract price, the contractor shall keep records of the costs of undertaking the amendment and of the time expended thereon. Such records shall be open to inspection by the supervisor at all reasonable times.

37.8. Where on provisional acceptance an increase or reduction in the total value of the works resulting from an administrative order, or from some other circumstance which is not caused by the contractor's default, exceeds 15% of the initial contract price (or as amended by addendum), the supervisor shall, after consulting the contracting authority and the contractor, determine any addition to or reduction from the contract price as a consequence of applying Article 37.6. The sum so determined shall be based on the amount by which the increase or decrease in value of the works exceeds 15%. The supervisor shall notify the sum to the contracting authority and the contractor, and adjust the contract price accordingly.

37.9. The contractor shall notify the contracting authority of any change of bank account, using the form in Annex V. The contracting authority shall have the right to oppose the contractor's change of bank account.

Article 38 - Suspension

38.1. Suspension by administrative order of the supervisor:

The contractor shall, on the order of the supervisor, suspend the progress of the works or any part thereof for such time or times and in such manner as the supervisor may consider necessary. The suspension shall take effect on the day the contractor receives the order or at a later date when the order so provides. The supervisor shall, as soon as possible, instruct the contractor to resume the contract suspended.

38.2. Suspension by notice of the contractor:

Any default in payment of more than 30 days under any certificate issued by the supervisor from the expiry of the time-limit referred to in Article 44.3(b) entitles the contractor, after giving not less than 30 days' notice to the contracting authority, to suspend the work, or reduce the rate of the work, unless and until the contractor has received reasonable evidence of payment or payment.

The contractor's action shall not prejudice its entitlements to interest for delayed payment under Article 53.1 and to termination under Article 65.1.

If the contractor subsequently receives such evidence or payment before giving notice of termination, the contractor shall resume normal working as soon as reasonably practicable and, unless the parties agree otherwise, no later than 30 days after receiving the evidence or the payment.

38.3. Suspension in the event of presumed breach of obligations, irregularities or fraud:

The contract may be suspended in order to verify whether presumed breach of obligations or irregularities or fraud occurred during the award procedure or the performance of the contract. If these are not confirmed, performance of the contract shall resume as soon as possible.

38.4. During the period of suspension, the contractor shall take such protective measures as may be necessary to safeguard the works, plant, equipment and site against any deterioration, loss or damage. Additional expenses incurred in connection with such protective measures may be added to the contract price, unless:

a) otherwise provided for in the contract; or

b) such suspension is necessary by reason of some breach or default of the contractor; or

c) such suspension is necessary by reason of normal climatic conditions on site; or

d) such suspension is necessary for the safety or the proper execution of the works or any part thereof insofar as such necessity does not arise from any act, breach or default by the supervisor or the contracting authority or from any of the exceptional risks referred to in Article 21, or

e) the presumed breach of obligations or irregularities or fraud mentioned in Article 38.3 are confirmed and attributable to the contractor.

38.5. The contractor shall introduce claims for additional payment or extension of the period of implementation in accordance with Articles 35 and 55.

38.6. If the period of suspension exceeds 180 days and the suspension is not due to the contractor's breach or default, the contractor may, by notice to the supervisor, request to proceed with the contract within 30 days, or terminate the contract.

38.7. The contracting authority shall, as soon as possible, order the contractor to resume the contract suspended or inform the contractor that it terminates the contract.

MATERIALS AND WORKMANSHIP

Article 39 - Work register

39.1. A work register shall, unless otherwise provided by the special conditions, be kept on the site by the supervisor, who shall enter in it at least the following information:

a) the weather conditions, interruptions of work owing to inclement weather, hours of work, number and type of workmen employed on the site, materials supplied, equipment in use, equipment not in working order, tests carried out in situ, samples dispatched, unforeseen circumstances, as well as orders given to the contractor;

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

39.2. The statements shall form an integral part of the work register but may, where appropriate, be recorded in separate documents. The technical rules for drawing up the statements shall be as set out in the special conditions.

39.3. The contractor shall ensure that statements are drawn up, in good time and in accordance with the special conditions, in respect of work, services and supplies which cannot be measured or verified subsequently; failing this, it shall accept the decisions of the supervisor, unless, at its own expense, it provides evidence to the contrary.

39.4. Entries made in the work register as work progresses shall be signed by the supervisor and countersigned by the contractor or its representative. If the contractor objects, it shall communicate its views to the supervisor within 15 days following the date on which the entry or the statements objected to are recorded. Should it fail to countersign or to submit its views within the period allowed, the contractor shall be deemed to agree with the notes shown in the register. The contractor may examine the work register at any time and may, without removing the document, make or receive a copy of entries which it considers necessary for its own information.

39.5. The contractor shall, on request, provide the supervisor with the information needed to keep the work register in good order.

Article 40 - Origin and quality of works and materials

40.1. Save where otherwise provided for in the special conditions, all goods purchased under the contract shall have their origin in any eligible source country as defined in the invitation to tender. The contractor must certify that the goods tendered comply with this requirement, specifying their countries of origin. It may be required to provide more detailed information in this respect. Failure to comply with this condition may result in the termination of the contract and/or suspension of payment.

40.2. The works, components and materials shall conform to the specifications, drawings, surveys, models, samples, patterns and other requirements in the contract which shall be

held at the disposal of the contracting authority or the supervisor for the purposes of identification throughout the period of performance.

40.3. Any preliminary technical acceptance stipulated in the special conditions shall be the subject of a request sent by the contractor to the supervisor. The request shall indicate the reference to the contract, the lot number and the place where such acceptance is to take place, as appropriate. The components and materials specified in the request must be certified by the supervisor as meeting the requirements for such acceptance prior to their incorporation in the works.

40.4. Even if materials or items to be incorporated in the works or in the manufacture of components have been technically accepted in this way, they may still be rejected if a further examination reveals defects or faults, in which case they must immediately be replaced by the contractor. The contractor may be given the opportunity to repair and make good materials and items which have been rejected, but such materials and items will be accepted for incorporation in the works only if they have been repaired and made good to the satisfaction of the supervisor.

Article 41 - Inspection and testing

41.1. The contractor shall ensure that the components and materials are delivered to the site in time to allow the supervisor to proceed with acceptance of the components and materials. The contractor is deemed to have fully appreciated the difficulties which it might encounter in this respect, and it shall not be permitted to advance any grounds for delay in fulfilling its obligations.

41.2. The supervisor shall be entitled to inspect, examine, measure and test the components, materials and workmanship, and check the progress of preparation, fabrication or manufacture of anything being prepared, fabricated or manufactured for delivery under the contract in order to establish whether the components, materials and workmanship are of the requisite quality and quantity. This shall take place at the place of manufacture, fabrication, preparation or on the site or at such other places as may be specified in the special conditions.

41.3. For the purposes of such tests and inspections, the contractor shall:

a) provide to the supervisor, temporarily and free of charge, such assistance, test samples or parts, machines, equipment, tools, labour, materials, drawings and production data as are normally required for inspection and testing;

b) agree, with the supervisor, on the time and place for tests;

c) provide access for the supervisor at all reasonable times to the place where the tests are to be carried out.

41.4. If the supervisor is not present on the date agreed for tests, the contractor may, unless otherwise instructed by the supervisor, proceed with the tests, which shall be deemed to have been made in the supervisor's presence. The contractor shall immediately send duly certified copies of the test results to the supervisor, who shall, if he has not attended the test, be bound by the test results.

41.5. When components and materials have passed the above-mentioned tests, the supervisor shall notify the contractor or endorse the procedure's certificate to that effect.

41.6. If the supervisor and the contractor disagree on the test results, each shall give a statement of its views to the other within 15 days after such disagreement arises. The supervisor or the contractor may require such tests to be repeated on the same terms and conditions or, if either party so requests, by an expert to be selected by common consent. All test reports shall be submitted to the supervisor who shall communicate the results of these tests without delay to the contractor. The results of the re-testing shall be conclusive. The cost of re-testing shall be borne by the party whose views are proved wrong by the re-testing.

41.7. In the performance of its duties, the supervisor and any persons authorised by him shall not disclose to unauthorised persons information concerning the undertaking's methods of manufacture and operation obtained through inspection and testing.

Article 42 - Rejection

42.1. Components and materials which are not of the specified quality shall be rejected. A special mark may be applied to the rejected components or materials. This shall not be such as to alter them or affect their commercial value. Rejected components and materials shall be removed by the contractor from the site within a period which the supervisor shall specify, failing which they shall be removed by the supervisor as of right at the expense and risk of the contractor. Any work incorporating rejected components or materials shall be rejected.

42.2. The supervisor shall, during the progress of the works and before the works are taken over, have the power to order or decide:

a) the removal from the site, within such time limits as may be specified in the order, of any components or materials which, in the opinion of the supervisor, are not in accordance with the contract;

b) the substitution of proper and suitable components or materials; or

c) the demolition and proper re-execution, or satisfactory repair, notwithstanding any previous test thereof or interim payment therefore, of any work which, in respect of components, materials, workmanship or design by the contractor for which it is responsible, is not, in the opinion of the supervisor, in accordance with the contract.

42.3. The supervisor shall, as soon as reasonably practicable, give to the contractor notice of its decision specifying particulars of the alleged defects.

42.4. The contractor shall with all speed and at its expense make good the defects so specified. If the contractor does not comply with such order, the contracting authority shall be entitled to employ other persons to carry out the same and all expenses consequent thereon or incidental thereto may be deducted by the contracting authority from any monies due or which may become due to the contractor.

42.5. The provisions of Article 42 shall not affect the right of the contracting authority to claim under Articles 36 and 63.

Article 43 - Ownership of plant and materials

43.1. All equipment, temporary works, plant and materials provided by the contractor shall, when brought on the site, be deemed to be exclusively intended for the execution of the works and the contractor shall not remove the same or any part thereof, except for the purpose of moving it from one part of the site to another, without the consent of the supervisor. Such consent shall, however, not be required for vehicles engaged in transporting any staff, labour, equipment, temporary works, plant or materials to or from the site.

43.2. The special conditions may provide that all equipment, temporary works, plant and materials on site owned by the contractor or by any company in which the contractor has a controlling interest shall, for the duration of the execution of the works, be:

a) vested in the contracting authority; or

b) made subject to a lien in favour of the contracting authority; or

c) made subject to any other arrangement regarding priority interest or security.

43.3. In the event of termination of the contract in accordance with Article 63 due to the contractor's breach of contract, the contracting authority shall be entitled to use the equipment, temporary works, plant and materials on site in order to complete the works.

43.4. Any agreement for the hire by the contractor of equipment, temporary works, plant and materials brought onto the site, shall contain a provision that on request in writing made by the contracting authority within 7 days after the date on which the termination under Article 64 becomes effective, and on the contracting authority undertaking to pay all hire charges in respect thereof from such date, the owner thereof will hire such equipment, temporary works, plant or materials to the contracting authority on the same terms as they were hired by the contractor, save that the contracting authority shall be entitled to permit the use thereof by any other contractor employed by it for completing the works under the provisions of Article 64.3.

43.5. Upon termination of the contract before completion of the works, the contractor shall deliver to the contracting authority any plant, temporary works, equipment or materials the property in which has vested in the contracting authority or been made subject to a lien by virtue of Article 43.2. If it fails to do so, the contracting authority may take such appropriate action as it deems fit in order to obtain possession of such plant, temporary works, equipment and materials and recover the cost of so doing from the contractor.

PAYMENTS

Article 44 - General principles

44.1. Payments shall be made in euro or national currency as specified in the special conditions. The special conditions shall lay down the administrative or technical conditions governing payments of pre-financing, interim and/or final payments made in accordance with the general conditions.

44.2. Payments due by the contracting authority shall be made to the bank account mentioned on the financial identification form completed by the contractor. The same form, annexed to the payment request must be used to report changes of bank account.

44.3. Payment to the contractor shall be done as follows:

a) Pre-financing payments shall be made within 90 days of receipt by the contracting authority of the contractor's invoice and the documents referred to in Article 46.3. The date of payment shall be the date on which the paying account is debited.

b) Payments to the contractor of the amounts due under each of the interim payment certificates and the final statement of account issued by the supervisor shall be made within 90 days of such certificate of statement accompanied by the contractor's invoice being delivered to the contracting authority. The date of payment shall be the date on which the paying account is debited.

44.4. The period referred to in 44.3 may be suspended by notifying the contractor that the invoice cannot be paid because the sum is not due, because appropriate substantiating documents have not been provided or because there is evidence that the expenditure might not be eligible. In the latter case, an inspection may be carried out on the spot for the purpose of further checks. The contractor shall provide clarifications, modifications or further information within 30 days of being asked to do so. Within 30 days of receipt of the clarification, the supervisor shall decide and issue if need be a revised payment certificate or a final statement of account and the payment period shall continue to run from this date.

44.5. The contractor undertakes to repay to the contracting authority any amounts paid in excess of the final amount due, before the deadline indicated in the debit note which is 45 days from the issuing of that note.

Should the contractor fail to make repayment within the above deadline, the contracting authority may (unless the ontractor is a government department or public body of a Member State of the European Union) increase the amounts due by adding interest:

- at the rediscount rate applied by the central bank of the country of the contracting authority if payments are in the currency of that country;

– at the rate applied by the European Central Bank to its main refinancing transactions in euro, as published in the Official Journal of the European Union, C series, where payments are in euro,

on the first day of the month in which the time-limit expired, plus three and a half percentage points. The default interest shall be incurred over the time which elapses between the date of the payment deadline and the date on which payment is actually made. Any partial payments shall first cover the interest thus established.

Amounts to be repaid to the contracting authority may be offset against amounts of any kind due to the contractor. This shall not affect the parties' right to agree on payment in instalments. Bank charges arising from the repayment of amounts due to the contracting authority shall be borne entirely by the contractor.

Without prejudice to the prerogative of the contracting authority, if necessary, the European Union may as donor proceed itself to the recovery by any means.

44.6. Prior to, or instead of, terminating the contract as provided for in Article 64, the contracting authority may suspend payments as a precautionary measure without prior notice.

44.7. Where the award procedure or the performance of the contract proves to have been subject to breach of obligations, irregularities or fraud attributable to the contractor, the contracting authority may in addition to the possibility to suspend the performance of the contract in accordance with Article 38.3 and terminate the contract as provided for in Article 64, suspend payments and/or recover amounts already paid, in proportion to the seriousness of the breach of obligations irregularities or fraud. In addition to measures referred above, the contracting authority may reduce the contract value in proportion to the seriousness of the irregularities, fraud or of the breach of obligations, including where the activities concerned were not implemented or were implemented poorly, partially or late.

Article 45 - Provisional price contracts

45.1. In exceptional cases, where a provisional price contract has been awarded, the amount payable under the contract shall be calculated as follows:

a) as for cost-plus contracts in Article 49.1 (c); or

b) initially on the basis of provisional prices and, after the conditions for performing the contract are known, as for lump-sum contracts or unit price contracts in Article 49.1 (a) and (b) respectively, or as in a hybrid contract.

45.2. The contractor shall supply such information as the contracting authority or the supervisor may reasonably require in respect of any matter relating to the contract for the purpose of the calculation. Where agreement cannot be reached on the valuation of the works, the amounts payable shall be determined by the supervisor.

Article 46 - Pre-financing

46.1. If the special conditions so provide, pre-financing may be granted to the contractor, at its request and before the first interim payment takes place, for operations connected with the implementation of the tasks, in the cases listed hereinafter:

a) as a lump-sum advance enabling it to meet expenditure resulting from the commencement of the contract;

b) as pre-financing for the purchase or order of : materials, plant, equipment, machines, tools and of any other substantial prior expenses such as the acquisition of patents or study costs, necessary for the execution of the contract. A proof of the conclusion of such purchase or order shall be provided by the contractor to obtain the pre-financing.

46.2. The special conditions shall state the amount of the pre-financing which shall not exceed 10% of the original contract price for the lump-sum referred to in Article 46.1 (a) and 20 % of the contract price for all other pre-financing referred to in Article 46.1 (b).

46.3. No pre-financing shall be granted until:

a) the signature of the contract;

b) provision of the performance guarantee in accordance with Article 15;

c) provision, for the full amount of the pre-financing, of a financial guarantee issued in accordance with Article 15.3 and 15.6 which shall remain effective until the pre-financing has been completely repaid by the contractor out of interim payments under the contract unless otherwise provided for in the special conditions;

d) fulfilment of the contractor's obligation under Article 16;

e) approval of the programme of implementation of tasks by the supervisor.

46.4. The contractor shall use the pre-financing exclusively for operations connected with the implementation of the tasks. Should the contractor misuse any portion of the pre-financing, it shall become due and repayable immediately and no further pre-financing payments will be made.

46.5. Should the pre-financing guarantee cease to be valid and the contractor fail to re-validate it, either a deduction equal to the amount of the pre-financing may be made by the contracting authority from future payments due to the contractor under the contract, or the contracting authority may apply the provisions of Article 15.6.

46.6. If the contract is terminated for any reason whatsoever or the Contractor has not repaid the pre-financing on request, the guarantees securing the pre-financing may be invoked forthwith in order to repay the balance of the pre-financing still owed by the contractor, and the guarantor shall not delay payment or raise objection for any reason whatever.

46.7. The pre-financing guarantee provided for in Article 46 shall be released as and when pre-financing is repaid.

46.8. Further conditions and procedures for granting and repaying pre-financing shall be as laid down in the special conditions.

Article 47 - Retention monies

47.1. The sum which shall be retained from interim payments by way of guarantee to meet the contractor's obligations during the defects liability period, and the detailed rules governing that guarantee, shall be stipulated in the special conditions, provided that it shall, in no case, exceed 10% of the contract price.

47.2. Subject to the approval of the contracting authority, the contractor may, if it so wishes, substitute, not later than the date fixed for the commencement of the works, these retention sums by a retention guarantee, respecting the provisions of Articles 15.3 and 15.6.

47.3. The sum retained or the retention guarantee shall be released within 60 days of the issuing of the signed final statement of account referred to in Article 51, for its total amount except for amounts which are the subject of amicable settlement, conciliation, arbitration or litigation.

Article 48 - Revision of prices

48.1. Unless otherwise stipulated in the special conditions, and except as provided in Article 48.4 the contract shall be at fixed prices which shall not be revised.

48.2. Where prices may be revised under the contract, such revision shall take into account variations in the prices of significant local or external elements which serve 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. The detailed rules for the revision shall be as laid down in the special conditions.

48.3. Prices contained in the contractor's tender shall be deemed:

a) to have been arrived at on the basis of the conditions in force 30 days prior to the latest date fixed for submission of tenders; or 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 Article 48.3 (a).

48.4. In the event of changes to, or introduction of, any national or State statute, ordinance, decree or other law, or any regulation or by-law of any local or other public authority, after the date stated in Article 48.3 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:

a) to amend the contract; or

b) on payment of compensation for the resulting imbalance by one party to the other; or

c) to terminate the contract by mutual agreement.

48.5. In the event of a delay in the implementation of the tasks for which the contractor is responsible, the indices to be considered for the revision of prices during the period of delay shall be the most advantageous to the contracting authority between those applied to the last interim certificate issued for tasks implemented during the period of implementation of tasks and those revised up to the provisional acceptance of the tasks.

Article 49 - Measurement

49.1. The following methods shall apply to the valuation of works contracts:

a) For lump-sum contracts, the amount due under the contract shall be determined on the basis of the breakdown of the overall contract price, or on the basis of a breakdown expressed as a percentage of the contract price corresponding to completed stages of the works. Where items are accompanied by quantities, these shall be firm quantities for which the contractor has submitted its all-in price, and shall be paid for irrespective of the quantities of work actually carried out.

b) For unit price contracts:

i. the amount due under the contract shall be calculated by applying the unit rates to the quantities actually executed for the respective items, in accordance with the contract;

ii. the quantities set out in the bill of quantities shall be the estimated quantities of the works, which shall not be taken as the actual and correct quantities of the works to be executed by the contractor in fulfilment of its obligations under the contract;

iii. the supervisor shall determine by measurement the actual quantities of the works executed by the contractor, and these shall be paid for in accordance with Article 50. Unless otherwise provided in the special conditions no additions shall be made to the items in the bill of quantities except as a result of an amendment in accordance with Article 37 or another provision of the contract entitling the contractor to additional payment;

iv. the supervisor shall, when he requires any parts of the works to be measured, give reasonable notice to the contractor to attend, or to send a qualified agent to represent him. The contractor or its agent shall assist the supervisor in making such measurements and shall furnish all particulars required by the supervisor. Should the contractor not attend, or omit to send such agent, the measurement made by the supervisor or approved by him shall be binding on the contractor;

v. the works shall be measured net, notwithstanding any general or local custom, except where otherwise provided for in the contract.

c) For cost-plus contracts, the amount due under the contract shall be determined on the basis of actual costs with an agreed addition for overheads and profit. The special conditions shall stipulate the information which the contractor is required

to submit to the supervisor for the purpose of Article 49.1 (c) and the manner in which it should be submitted.

49.2. Where an item in the contract is indicated as 'provisional' the provisional sum set aside for it shall not be taken into account in calculating the percentages referred to in Article 37.

Article 50 - Interim payments

50.1. The contractor shall submit an invoice for interim payment to the supervisor at the end of each period referred to in Article 50.7 in a form approved by the supervisor. The invoice shall include the following items, as applicable:

a) the estimated contract value of the permanent works implemented up to the end of the period in question;

b) an amount reflecting any revision of prices pursuant to Article 48;

c) an amount to be withheld as retention sum under Article 47;

d) any credit and/or debit for the period in question in respect of plant and materials on site intended for, but not yet incorporated in, the permanent works in the amount and under the conditions set out in Article 50.2;

e) an amount to be deducted on account of the pre-financing repayment under the provisions of Article 46; and

f) any other sum to which the contractor may be entitled under the contract.

50.2. The contractor shall be entitled to such sums as the supervisor may consider proper in respect of plant and materials intended for, but not yet incorporated in, the permanent works provided that:

a) the plant and materials conform with the specifications for the permanent works and are set out in batches in a way that they may be recognized by the supervisor;

b) such plant and materials have been delivered to the site, and are properly stored and protected against loss or damage or deterioration to the satisfaction of the supervisor;

c) the contractor's record of requirements, orders, receipts and use of plant and materials under the contract are kept in a form approved by the supervisor and such records are available for inspection by the supervisor;

d) the contractor submits with its statement, the estimated value of the plant and materials on site together with such documents as may be required by the supervisor for the purpose of valuation of the plant and materials and providing evidence of ownership and payment therefor; and

e) where the special conditions so provide, ownership of the plant and materials referred to in Article 43 shall be deemed to be vested in the contracting authority.

50.3. Approval by the supervisor of any interim invoice certified by him in respect of plant and materials pursuant to Article 50 shall be without prejudice to the exercise of any power of

the supervisor under the contract to reject any plant or materials which are not in accordance with the provisions of the contract.

50.4. The contractor shall be responsible for any loss or damage to, and for the cost of storing and handling of, such plant and materials on site and shall effect such additional insurance as may be necessary to cover the risk of such loss or damage from any cause.

50.5. Within 30 days of receipt of the said invoice for interim payment, the supervisor shall:

a) verify that, in the supervisor's opinion, the invoice for interim payment reflects the amount due to the contractor in accordance with the contract. In cases where there is a difference of opinion as to the value of an item, the supervisor's view shall prevail.

b) on determination of the amount due to the contractor, issue and transmit to the contracting authority for payment and to the contractor for information, an interim payment certificate for the amount due to the contractor and shall inform the contractor of the works for which payment is being made.

50.6. The supervisor may, by an interim payment certificate, make any corrections or modifications to any previous certificate issued by him, and has power to modify the valuation in or withhold the issue of, any interim payment certificate if the works or any part thereof is not being carried out to its satisfaction.

50.7. Unless the special conditions provide otherwise, the frequency shall be one interim payment per month.

Article 51 - Final statement of account

51.1. Unless otherwise agreed in the special conditions, the contractor shall submit to the supervisor a draft final statement of account no later than 90 days after the issue of the final acceptance certificate referred to in Article 62. In order to enable the supervisor to prepare the final statement of account, the draft final statement of account is submitted with supporting documents showing in detail the value of the work done in accordance with the contract and all further sums which the contractor considers to be due to it under the contract.

51.2. Within 90 days after receipt of the draft final statement of account and of all information reasonably required for its verification, the supervisor shall prepare and sign the final statement of account, which determines:

a) the amount which in its opinion is finally due under the contract; and

b) after establishing the amounts previously paid by the contracting authority and all sums to which the contracting authority is entitled under the contract, the balance, if any, due from the contracting authority to the contractor, or from the contractor to the contracting authority, as the case may be.

51.3. The supervisor shall issue to the contracting authority or to its duly authorized representative, and to the contractor, the final statement of account showing the final amount to which the contractor is entitled under the contract. The contracting authority or

its duly authorized representative and the contractor shall sign the final statement of account as an acknowledgement of the full and final value of the work implemented under the contract and shall promptly submit a signed copy to the supervisor together with the invoice for the payment of the agreed balance, if any, due to the contractor. However, the final statement of account and the invoice for the payment of the balance shall not include amounts in dispute which are the subject of negotiations, conciliation, arbitration or litigation.

51.4. The final statement of account signed by the contractor constitutes a written discharge of the contracting authority confirming that the total in the final statement of account represents full and final settlement of all monies due to the contractor under the contract, other than those amounts which are the subject of amicable settlement, arbitration or litigation. However, such discharge becomes effective only after any payment due in accordance with the final statement of account has been made and the performance guarantee referred to in Article 15 has been returned to the contractor.

51.5. The contracting authority is not liable to the contractor for any matter or thing whatsoever arising out of, or in accordance with, the contract or execution of the works, unless the contractor has included a claim in respect thereof in its draft final statement of account.

Article 52 - Direct payments to sub-contractors

52.1. When the supervisor receives a claim from a sub-contractor duly approved under Article 7 to the effect that the contractor has not met its financial obligations so far as the sub-contractor is concerned, the supervisor gives notice to the contractor either to pay the sub-contractor or to inform it of the reasons why payment should not be made. Should such payment not be made, or reasons not be given within the period of notice, the supervisor may, after satisfying itself that the work has been carried out, certify, and the contracting authority pays the debt claimed by the sub-contractor out of the sums remaining due to the contractor. The contractor remains entirely responsible for the work in respect of which direct payment has been made.

52.2. If the contractor gives adequate reasons for refusing to settle all or part of the debt claimed by the sub-contractor, the contracting authority only pays to the sub-contractor only the amounts not in dispute. Sums claimed by the sub-contractor in respect of which the contractor has given adequate reasons for its refusal to pay shall be paid by the contracting authority only after the parties have come to an amicable settlement, or after the decision of an arbitrating authority or after a judgment of a court has been duly notified to the supervisor.

52.3. Direct payments to sub-contractors shall not exceed the value at contract prices of the services performed by the sub-contractors for which they request payment; the value at contract prices is calculated or assessed on the basis of the bill of quantities, the price schedule or the breakdown of the lump sum price.

52.4. Direct payments to sub-contractors are made entirely in the national currency of the country in which the works are executed, or partly in such national currency and partly in foreign currency, in accordance with the contract.

52.5. Where direct payments to sub-contractors are made in foreign currency, they are calculated in accordance with Article 56. They shall not result in any increase in the total amount payable in foreign currency, as stipulated in the contract.

52.6. The provisions of Article 52 apply subject to the requirements of the law applicable by virtue of Article 54 concerning the right to payment of creditors who are beneficiaries of an assignment of credit or of a collateral security.

Article 53 - Delayed payments

53.1. Once the time-limit referred to in Article 44.3 of the general conditions has expired, the contractor will, upon demand, submitted within two months of receiving late payment, be entitled to late-payment interest:

- at the rediscount rate applied by the central bank by the law of the country in which the works are executed if payments are in the currency of that country;

- at the rate applied by the European Central Bank to its main refinancing transactions in euro, as published in the Official Journal of the European Union, C series, if payments are in euro,

on the first day of the month in which the time-limit expired, plus three and a half percentage points. The interest shall be payable for the time elapsed between the expiry of the payment deadline and the date on which the contracting authority's account is debited.

53.2. Any default in payment of more than 30 days after the expiry of the time-limit stated in Article 44.3(b) shall entitle the contractor to suspend the work in accordance with the procedure laid down in Article 38.2.

53.3. Any default in payment of more than 120 days after the expiry of the time-limit stated in Article 44.3(b) shall entitle the contractor to terminate the contract in accordance with the procedure laid down in Article 65.

Article 54 - Payments to third parties

54.1. Orders for payments to third parties may be carried out only after an assignment made in accordance with Article 6. The assignment is notified to the contracting authority.

54.2. Notification of beneficiaries of the assignment is the sole responsibility of the contractor.

54.3. In the event of a legally binding attachment of the property of the contractor affecting payments due to it under the contract, and without prejudice to the time limit laid down in Article 53, the contracting authority has 30 days, starting from the day when it receives notification of the definitive lifting of the obstacle to payment, to resume payments to the contractor.

Article 55 - Claims for additional payment

55.1. If the contractor considers itself being entitled to additional payment under the contract, the contractor shall:

a) if it intends to make any claim for additional payment, give to the supervisor notice of its intention or make such claim no later than 15 days after the contractor became aware, or should have become aware of the event or circumstances giving rise of such claim, stating the reason for its claim;

If the contractor fails to give notice of a claim for additional payment within such period of 15 days, the contractor shall not be entitled to additional payment, and the contracting authority shall be discharged from all liability in connection with the request; and

b) submit full and detailed particulars of its claim as soon as it is reasonably practicable, but no later than 60 days after the date of such notice, unless otherwise agreed by the supervisor. In case the supervisor agrees to another deadline than the said 60 days, the agreed upon deadline will, in any event, require that such particulars shall be submitted no later than the date of submission of the draft final statement of account. The contractor shall thereafter promptly submit such further particulars as the supervisor may reasonably require assessing the validity of the claim.

55.2. When the supervisor has received the full and detailed particulars of the contractor's claim that it requires, he shall, without prejudice to Article 21.4, after due consultation with the contracting authority and, where appropriate, the contractor, determine whether the contractor is entitled to additional payment and notify the parties accordingly.

55.3. The supervisor may reject any claim for additional payment which does not comply with the requirements of Article 55.

Article 56 - End date

56.1. The payment obligations of the EC under this contract shall cease at most 18 months after the end of the period of implementation of tasks, unless the contract is terminated in accordance with these general conditions. In the event of co-financing, this date shall be laid down in the special conditions.

ACCEPTANCE AND DEFECTS LIABILITY

Article 57 - General principles

57.1. Verification of the works by the supervisor with a view to provisional or final acceptance shall take place in the presence of the contractor. The absence of the contractor shall not be a bar to verification on condition that the contractor has been summoned in due form at least 30 days prior to the date of verification.

57.2. Should exceptional circumstances make it impossible to ascertain the state of the works or otherwise proceed with their acceptance during the period fixed for provisional or final acceptance, a statement certifying such impossibility shall be drawn up by the supervisor after consultation, where possible, with the contractor. The verification shall take place and a statement of acceptance or rejection shall be drawn up by the supervisor within 30 days following the date on which such impossibility ceases to exist. The contractor shall not invoke these circumstances in order to avoid its obligation of presenting the works in a state suitable for acceptance.

Article 58 - Tests on completion

58.1. The works shall not be accepted until the prescribed verifications and tests have been carried out at the expense of the contractor. The contractor shall notify the supervisor of the date on which such verification and tests may commence.

58.2. Works which do not satisfy the terms and conditions of the contract, or in the absence of such terms and conditions, which are not carried out in accordance with trade practices in the country in which the works are executed, shall, if required, be demolished and rebuilt by the contractor or repaired to the satisfaction of the supervisor, otherwise this shall be done as of right after due notice at the expense of the contractor, by order of the supervisor. The supervisor may also require the demolition and reconstruction by the contractor, or repair to the satisfaction of the supervisor, under the same conditions, of any work in which unacceptable materials have been used, or carried out in the periods of suspension provided for in Article 38.

Article 59 - Partial acceptance

59.1. The contracting authority may make use of the various structures, parts of structures or sections of the works forming part of the contract as and when they are completed. Any taking over of the structures, parts of structures or sections of the works by the contracting authority shall be preceded by their partial provisional acceptance. However, works may in cases of urgency be taken over prior to acceptance provided an inventory of outstanding work is drawn up by the supervisor and agreed to by the contractor and the supervisor beforehand. Once the contracting authority has taken possession of a structure, a part thereof or section of the works, the contractor shall no longer be required to make good any damage resulting otherwise than from faulty construction or workmanship.

59.2. The supervisor may, at the request of the contractor and if the nature of the works so permits, proceed with partial provisional acceptance, provided that the structures, parts of structures or sections of the works are completed and suited to the use as described in the contract.

59.3. In the cases of partial provisional acceptance referred to in Article 59.1 and 59.2 the defects liability period provided for in Article 62 shall, unless the special conditions provide otherwise, run as from the date of such partial provisional acceptance.

Article 60 - Provisional acceptance

60.1. The works shall be taken over by the contracting authority when they have satisfactorily passed the tests on completion and a certificate of provisional acceptance has been issued or is deemed to have been issued.

60.2. The contractor may apply, by notice to the supervisor, for a certificate of provisional acceptance not earlier than 15 days before the works, in the contractor's opinion, are complete and ready for provisional acceptance. The supervisor shall within 30 days after the receipt of the contractor's application either:

a) issue the certificate of provisional acceptance to the contractor with a copy to the contracting authority stating, where appropriate, its reservations, and, inter alia, the date on which, in its opinion, the works were completed in accordance with the contract and ready for provisional acceptance; or

b) reject the application giving its reasons and specifying the action which, in its opinion, is required of the contractor for the certificate to be issued.

60.3. If the supervisor fails either to issue the certificate of provisional acceptance or to reject the contractor's application within the period of 30 days, he shall be deemed to have issued the certificate on the last day of that period. The certificate of provisional acceptance shall not be deemed to be an admission that the works have been completed in every respect. If the works are divided by the contract into sections, the contractor shall be entitled to apply for separate certificates for each of the sections.

60.4. Upon provisional acceptance of the works, the contractor shall dismantle and remove temporary structures as well as materials no longer required for use in connection with the implementation of the contract. It shall also remove any litter or obstruction and redress any change in the condition of the site as required by the contract.

60.5. Immediately after provisional acceptance, the contracting authority may make use of all the works as completed.

Article 61 - Defects liability

61.1. The contractor shall be responsible for making good any defect in, or damage to, any part of the works which may appear or occur during the defects liability period and which:

a) results from the use of defective plant or materials or faulty workmanship or design of the contractor; and/or

b) results from any act or omission of the contractor during the defects liability period; and/or;

c) appears in the course of an inspection made by, or on behalf of the contracting authority.

61.2. The contractor shall at its own cost make good the defect or damage as soon as practicable. The defects liability period for all items replaced or renewed shall

recommence from the date when the replacement or renewal was made to the satisfaction of the supervisor. If the contract provides for partial acceptance, the defects liability period shall be extended only for the part of the works affected by the replacement or renewal.

61.3. If any such defect appears or such damage occurs, during the defects liability period, the contracting authority or the supervisor shall notify the contractor. If the contractor fails to remedy a defect or damage within the time limit stipulated in the notification, the contracting authority may:

a) carry out the works itself, or employ someone else to carry out the works at the contractor's risk and cost, in which case the costs incurred by the contracting authority shall be deducted from monies due to or from guarantees held against the contractor or from both; or

b) terminate the contract.

61.4. If the defect or damage is such that the contracting authority has been deprived substantially of the whole or a part of the benefit of the works, the contracting authority shall, without prejudice to any other remedy, be entitled to recover all sums paid in respect of the parts of the works concerned together with the cost of dismantling such parts and clearing the site.

61.5. In case of emergency, where the contractor is not immediately available or, having been reached, is unable to take the measures required, the contracting authority or the supervisor may have the work carried out at the expense of the contractor. The contracting authority or the supervisor shall as soon as practicable inform the contractor of the action taken.

61.6. Where the special conditions stipulate that the maintenance work, necessitated by normal wear and tear, shall be carried out by the contractor, such work shall be paid for from a provisional sum. Deterioration resulting from the circumstances provided for in Article 21 or from abnormal use shall be excluded from this obligation unless it reveals a fault or defect justifying the request for repair or replacement under Article 61.

61.7. The defects liability period shall be stipulated in the special conditions and technical specifications. If the duration of the defects liability period is not specified, it shall be 365 days. The defects liability period shall commence on the date of provisional acceptance and may recommence in accordance with Article 61.2.

61.8. After provisional acceptance and without prejudice to the defects liability referred to in Article 61, the contractor shall no longer be responsible for risks which may affect the works and which result from causes not attributable to it. However, the contractor shall be responsible as from the date of provisional acceptance for the soundness of the construction, as laid down in the law of the country in which the works are executed.

Article 62 - Final acceptance

62.1. Upon the expiry of the defects liability period, or where there is more than one such period, upon the expiry of the latest period, and when all defects or damage have been

rectified, the supervisor shall issue to the contractor a final acceptance certificate and a copy thereof to the contracting authority stating the date on which the contractor completed its obligations under the contract to the supervisor's satisfaction. The final acceptance certificate shall be given by the supervisor within 30 days after the expiration of the defects liability period, or as soon as any works ordered under Article 61 have been completed to the satisfaction of the supervisor.

62.2. The works shall not be considered as completed until the final acceptance certificate has been signed by the supervisor and delivered to the contracting authority, with a copy to the contractor.

62.3. Notwithstanding the issuance of the final acceptance certificate, the contractor and the contracting authority shall remain liable for the fulfilment of any obligation incurred under the contract prior to the issue of the final acceptance certificate, which remains unperformed at the time such final acceptance certificate is issued. The nature and extent of any such obligation shall be determined by reference to the provisions of the contract.

BREACH OF CONTRACT AND TERMINATION

Article 63 - Breach of contract

63.1. Either party commits a breach of contract where it fails to perform its obligations in accordance with the provisions of the contract.

63.2. Where a breach of contract occurs, the party injured by the breach is entitled to the following remedies:

a) damages; and/or

b) termination of the contract.

63.3. Damages may be either:

a) general damages; or

b) liquidated damages.

63.4. Should the contractor fail to perform any of its obligations in accordance with the provisions of the contract, the contracting authority is without prejudice to its right under Article 63.2, also entitled to the following remedies:

a) suspension of payments; and/or

b) reduction or recovery of payments in proportion to the failure's extent.

63.5. Where the contracting authority is entitled to damages, it may deduct such damages from any sums due to the contractor or call on the appropriate guarantee.

Article 64 - Termination by the contracting authority

64.1. The contracting authority may, at any time and with immediate effect, subject to Article 64.9, terminate the contract, except as provided for under Article 64.2.

64.2. Subject to any other provision of these general conditions the contracting authority may, by giving seven days' notice to the contractor, terminate the contract and expel the contractor from the site in any of the following cases where:

a) the contractor is in serious breach of contract for failure to perform its contractual obligations;

b) the contractor fails to comply within a reasonable time with the notice given by the supervisor requiring it to make good the neglect or failure to perform its obligations under the contract which seriously affects the proper and timely performance of the works;

c) the contractor refuses or neglects to carry out any administrative orders given by the supervisor;

d) the contractor assigns the contract or sub-contracts without the authorisation of the contracting authority;

e) the contractor is bankrupt, subject to insolvency or winding up procedures, is having its assets administered by a liquidator or by the courts, has entered into an arrangement with creditors, has suspended business activities, or is in any analogous situation arising from a similar procedure provided for under any national law or regulation relevant to that contractor;

f) any organisational modification occurs involving a change in the legal personality, nature or control of the contractor, unless such modification is recorded in an addendum to the contract;

g) any other legal disability hindering performance of the contract occurs;

h) the contractor fails to provide the required guarantees or insurance, or the person providing the earlier guarantee or insurance is not able to abide by its commitments;

i) the contractor has been guilty of grave professional misconduct proven by any means which the contracting authority can justify;

j) it has been established by a final judgment or a final administrative decision or by proof in possession of the contracting authority that the contractor has been guilty of fraud, corruption, involvement in a criminal organisation, money laundering or terrorist financing, terrorist related offences, child labour or other forms of trafficking in human beings or circumventing fiscal, social or any other applicable legal obligations, including through the creation of an entity for this purpose;

k) the contractor, in the performance of another contract financed by the EU budget/EDF funds, has been declared to be in serious breach of contract, which has led to its early termination or the application of liquidated damages or other contractual penalties or which has been discovered following checks, audits or investigations by the European Commission, the contracting authority, OLAF or the Court of Auditors;

l) after the award of the contract, the award procedure or the performance of the contract proves to have been subject to breach of obligations, irregularities or fraud;

m) the award procedure or the performance of another contract financed by the EU budget/EDF funds proves to have been subject to breach of obligations, irregularities or fraud which are likely to affect the performance of the present contract;

n) the contractor fails to perform its obligation in accordance with Article 12.8, Article 12a or Article 12b;

o) the contracting authority has become entitled to the maximum claim under Article 36.1;

p) the contractor fails to perform its obligation in accordance with Article 61.3;

q) the contractor is in breach of the data protection obligations resulting from Article 72 of these general conditions.

The cases of termination under points (e), (i), (j), (l), (m) and (n) may refer also to persons who are members of the administrative, management or supervisory body of the contractor and/or to persons having powers of representation, decision or control with regard to the contractor.

The cases of termination under points (a), (e), (f), (g), (i), (j), (k), (l), (m) and (n) may refer also to persons jointly and severally liable for the performance of the contract.

The cases under points (e), (i), (j), (k), (l), (m), (n) and (q) may refer also to subcontractors.

64.3. Termination shall be without prejudice to any other rights or powers under the contract of the contracting authority and the contractor. The contracting authority may, thereafter, complete the works itself or conclude any other contract with a third party, at the contractor's own expense. The contractor's liability for delay in completion shall immediately cease when the contracting authority terminates the contract without prejudice to any liability thereunder that may already have arisen.

64.4. Upon termination of the contract or when it has received notice thereof, the contractor shall take immediate steps to bring the works to a close in a prompt and orderly manner and to reduce expenditure to a minimum.

64.5. The supervisor shall, as soon as possible after termination, certify the value of the works and all sums due to the contractor as at the date of termination.

64.6. In the event of termination:

a) a report of work performed by the contractor shall be drawn up by the supervisor as soon as possible after inspection of the works, and inventory taken of temporary structures, materials, plant and equipment. The contractor shall be summoned to be present during the inspection and the taking of the inventory. The supervisor shall also draw up statements of emoluments still owed by the contractor to workers employed by him in relation to the contract and of sums owed by the contractor to the contracting authority;

b) the contracting authority shall have the option of acquiring in whole or in part temporary structures which have been approved by the supervisor, equipment, plant and materials specifically supplied or manufactured in connection with the execution of work under the contract;

c) the purchase price of the temporary structures, equipment, plant and materials referred to above shall not exceed the unpaid portion of the expenditure incurred by the contractor, such expenditure being limited to that required for the performance of the contract under normal conditions;

d) the contracting authority may purchase, at market prices, the materials and items supplied or ordered by the contractor and not already paid for by the contracting authority on such conditions as the supervisor considers appropriate.

64.7. The contracting authority shall not be obliged to make any further payments to the contractor until the works are completed. After the works are completed, the contracting authority shall recover from the contractor the extra costs, if any, of completing the works, or shall pay any balance still due to the contractor.

64.8. If the contracting authority terminates the contract pursuant to Article 64.2, it shall, in addition to the extra costs for completion of the works and without prejudice to its other remedies under the contract, be entitled to recover from the contractor any loss it has suffered up to 10% of the contract price.

64.9. Where the termination is not due to an act or omission of the contractor, force majeure or other circumstances beyond the control of the contracting authority, the contractor shall be entitled to claim in addition to sums owed to it for work already performed, an indemnity for loss suffered.

64.10. This contract shall be automatically terminated if it has not given rise to any payment in the two years following its signing by both parties.

Article 65 - Termination by the contractor

65.1. The contractor may, by giving 14 days' notice to the contracting authority, terminate the contract if the contracting authority:

a) fails for more than 120 days to pay the contractor the amounts due under any certificate issued by the supervisor after the expiry of the time limit stated in Article 44.3; or

b) consistently fails to meet its obligations after repeated reminders; or

c) suspends the progress of the works or any part thereof for more than 180 days for reasons not specified in the contract, or not attributable to the contractor's breach or default.

65.2. Such termination shall be without prejudice to any other rights of the contracting authority or the contractor acquired under the contract. Upon such termination, the contractor shall, subject to the law of the country in which the works are executed, be entitled to immediately remove its equipment from the site.

65.3. In the event of such termination, the contracting authority shall pay the contractor for any loss or damage the contractor may have suffered. The maximum amount shall be 10% of the contract price.

Article 66 - Force majeure

66.1. Neither party shall be considered to be in default or in breach of its obligations under the contract if the performance of such obligations is prevented by any circumstances of force majeure which arises after the date of notification of award or the date when the contract becomes effective.

66.2. The term force majeure, as used herein covers any unforeseeable events, not within the control of either party and which by the exercise of due diligence neither party is able to overcome such as acts of God, strikes, lock-outs or other industrial disturbances, acts of the public enemy, wars whether declared or not, blockades, insurrection, riots, epidemics, landslides, earthquakes, storms, lightning, floods, washouts, civil disturbances, explosions. A decision of the European Union to suspend the cooperation with the partner country is considered to be a case of force majeure when it implies suspension of funding this contract.

66.3. Notwithstanding the provisions of Articles 36 and 64, the contractor shall not be liable to forfeiture of its performance guarantee, liquidated damages or termination for default if, and to the extent that, its delay in performance or other failure to perform its obligations under the contract is the result of an event of force majeure. The contracting authority shall similarly not be liable, notwithstanding the provisions of Articles 53 and 65, for payment of interest on delayed payments, for non-performance or for termination by the contractor for default, if, and to the extent that, the contracting authority's delay or other failure to perform its obligations is the result of force majeure.

66.4. If either party considers that any circumstances of force majeure have occurred which may affect performance of its obligations, it shall promptly notify the other party and the supervisor, giving details of the nature, the probable duration and the likely effect of the circumstances. Unless otherwise directed by the supervisor in writing, the contractor shall continue to perform its obligations under the contract as far as is reasonably practicable, and shall seek all reasonable alternative means for performance of its obligations which are not prevented by the force majeure event. The contractor shall not put into effect such alternative means unless directed so to do by the supervisor.

66.5. If the contractor incurs additional costs in complying with the supervisor's directions or using alternative means under Article 66.4, the amount thereof shall be certified by the supervisor.

66.6. If circumstances of force majeure have occurred and continue for a period of 180 days then, notwithstanding any extension of time for completion of the works that the contractor may by reason thereof have been granted, either party shall be entitled to serve upon the other 30 days' notice to terminate the contract. If, at the expiry of the period of 30 days, force majeure persists, the contract shall terminate and, in consequence thereof under the law governing the contract, the parties shall be released from further performance of the contract.

Article 67 - Decease

67.1. Where the contractor is a natural person, the contract shall be automatically terminated if that person dies. However, the contracting authority shall examine any proposal made by the heirs or beneficiaries if they have notified their wish to continue the contract.

67.2. Where the contractor consists of a number of persons and one or more of them die, a report shall be agreed between the parties on the progress of the works, and the contracting authority shall decide whether to terminate or continue the contract in accordance with the undertaking given by the survivors and by the heirs or beneficiaries, as the case may be. The decision of the contracting authority shall be notified to those concerned within 30 days of receipt of such proposal.

67.3. In the cases provided for in Article 67.1 and 67.2, persons offering to continue to perform the contract shall notify the contracting authority thereof within 15 days of the date of decease.

67.4. Such persons shall be jointly and severally liable for the proper performance of the contract to the same extent as the deceased contractor. Continuation of the contract shall be subject to the rules relating to establishment of any guarantee provided for in the contract.

SETTLEMENT OF DISPUTES AND APPLICABLE LAW

Article 68 - Settlement of disputes

68.1. The parties shall make every effort to settle amicably any dispute relating to the contract which may arise between them, or between the supervisor and the contractor.

68.2. Once a dispute has arisen, a party shall notify the other party of the dispute, stating its position on the dispute and any solution which it envisages, and requesting an amicable settlement. The other party shall respond to this request for amicable settlement within 30 days, stating its position on the dispute. Unless the parties agree otherwise, the maximum time period laid down for reaching an amicable settlement shall be 120 days from the date of the notification requesting such a procedure. Should a party not agree to the other party's request for amicable settlement, should a party not respond in time to that request

or should no amicable settlement be reached within the maximum time period, the amicable settlement procedure is considered to have failed.

68.3. In the absence of an amicable settlement, a party may notify the other party requesting a settlement through conciliation by a third person. If the European Commission is not a party to the contract, it may accept to intervene as conciliator. The other party shall respond to the request for conciliation within 30 days. Unless the parties agree otherwise, the maximum time period laid down for reaching a settlement through conciliation shall be 120 days from the notification requesting such a procedure. Should a party not agree to the other party's request for conciliation, should a party not respond in time to that request or should no settlement be reached within the maximum time period, the conciliation procedure is considered to have failed.

68.4. If the amicable settlement procedure and, if so requested, the conciliation procedure fails, each party may refer the dispute to either the decision of a national jurisdiction or arbitration, as specified in the special conditions.

Article 69 - Applicable Law

69.1. This contract shall be governed by the law of the country of the contracting authority or, where the contracting authority is the European Commission, by the applicable European Union law complemented where necessary by the law of Belgium.

FINAL PROVISIONS

Article 70 - Administrative sanctions

70.1. Without prejudice to the application of other remedies laid down in the contract, a sanction of exclusion from all contracts and grants financed by the EU, may be imposed, after an adversarial procedure in line with the applicable Financial Regulation, upon the contractor who, in particular,

a) is guilty of grave professional misconduct, has committed irregularities or has shown significant deficiencies in complying with the main obligations in the performance of the contract or has been circumventing fiscal, social or any other applicable legal obligations, including through the creation of an entity for this purpose. The duration of the exclusion shall not exceed the duration set by final judgement or final administrative decision or, in the absence thereof, three years;

b) is guilty of fraud, corruption, participation in a criminal organisation, money laundering, terrorist-related offences, child labour or trafficking in human beings. The duration of the exclusion shall not exceed the duration set by final judgement or final administrative decision or, in the absence thereof, five years.

70.2. In the situations mentioned in Article 70.1, in addition or in alternative to the sanction of exclusion, the contractor may also be subject to financial penalties representing 2-10% of the contract price.

70.3. Where the contracting authority is entitled to impose financial penalties, it may deduct such financial penalties from any sums due to the contractor or call on the appropriate guarantee.

70.4. The decision to impose administrative sanctions may be published on a dedicated internet-site, explicitly naming the contractor.

Article 71 - Verifications, checks and audits by European Union bodies

71.1. The contractor will allow the European Commission, the European Anti-Fraud Office and the European Court of Auditors to verify, by examining the documents and to make copies thereof or by means of on-the-spot checks, including checks of documents (original or copies), the implementation of the contract. In order to carry out these verifications and audits, the EU bodies mentioned above shall be allowed to conduct a full audit, if necessary, on the basis of supporting documents for the accounts, accounting documents and any other document relevant to the financing of the project. The contractor shall ensure that on-the-spot accesses is available at all reasonable times, notably at the contractor's offices, to its computer data, to its accounting data and to all the information needed to carry out the audits, including information on individual salaries of persons involved in the project. The contractor shall ensure that the information is readily available at the moment of the audit and, if so requested, that data be handed over in an appropriate form. These inspections may take place up to 7 years after the final payment.

71.2. Furthermore, the contractor will allow the European Anti-Fraud Office to carry out checks and verification on the spot in accordance with the procedures set out in the European Union legislation for the protection of the financial interests of the European Union against fraud and other irregularities.

71.3. To this end, the contractor undertakes to give appropriate access to staff or agents of the European Commission, of the European Anti-Fraud Office and of the European Court of Auditors to the sites and locations at which the contract is carried out, including its information systems, as well as all documents and databases concerning the technical and financial management of the project and to take all steps to facilitate their work. Access given to agents of the European Commission, European Anti-Fraud Office and the European Court of Auditors shall be on the basis of confidentiality with respect to third parties, without prejudice to the obligations of public law to which they are subject. Documents must be easily accessible and filed so as to facilitate their examination and the contractor must inform the contracting authority of their precise location.

71.4. The contractor guarantees that the rights of the European Commission, of the European Anti-Fraud Office and of the European Court of Auditors to carry out audits, checks and verification will be equally applicable, under the same conditions and according to the same rules as those set out in this Article, to any sub-contractor or any other party benefiting from EU budget/EDF funds.

71.5. Failure to comply with the obligations set forth in Article 71.1 to 71.4 constitutes a case of serious breach of contract.

Article 72 - Data protection

72.1. Processing of personal data by the contracting authority

Any personal data included in or relating to the contract, including its implementation, shall be processed in accordance with Regulation (EU) 2018/1725. Such data shall be processed solely for the purposes of the implementation, management and monitoring of the contract by the data controller.

The contractor or any other person whose personal data is processed by the data controller in relation to this contract has specific rights as a data subject under Chapter III (Articles 14-25) of Regulation (EU) 2018/1725, in particular the right to access, rectify or erase their personal data and the right to restrict the processing of their personal data or, where applicable, the right to object to processing or the right to data portability.

Should the contractor or any other person whose personal data is processed in relation to this contract have any queries concerning the processing of its personal data, it shall address itself to the data controller. They may also address themselves to the Data Protection Officer of the data controller. They have the right to lodge a complaint at any time to the European Data Protection Supervisor.

Details concerning the processing of personal data are available in the data protection notice referred to in the special conditions.

72.2 Processing of personal data by the contractor

The processing of personal data by the contractor shall meet the requirements of the general conditions and be processed solely for the purposes set out by the controller.

The contractor shall assist the controller for the fulfilment of the controller's obligation to respond to requests for exercising rights of person whose personal data is processed in relation to this contract as laid down in Chapter III (Articles 14-25) of Regulation (EU) 2018/1725. The contractor shall inform without delay the controller about such requests.

The contractor may act only on documented written instructions and under the supervision of the controller, in particular with regard to the purposes of the processing, the categories of data that may be processed, the recipients of the data and the means by which the data subject may exercise its rights.

The contractor shall grant personnel access to the data to the extent strictly necessary for the implementation, management and monitoring of the contract. The contractor must ensure that personnel authorised to process personal data has committed itself to confidentiality or is under appropriate statutory obligation of confidentiality in accordance with the provisions of Article 12.7 of these general conditions.

The contractor shall adopt appropriate technical and organisational security measures, giving due regard to the risks inherent in the processing and to the nature, scope, context and purposes of processing, in order to ensure, in particular, as appropriate:

(a) the pseudonymisation and encryption of personal data;

(b) the ability to ensure the ongoing confidentiality, integrity, availability and resilience of processing systems and services;
(c) the ability to restore the availability and access to personal data in a timely manner in the event of a physical or technical incident;
(d) a process for regularly testing, assessing and evaluating the effectiveness of technical and organisational measures for ensuring the security of the processing;
(e) measures to protect personal data from accidental or unlawful destruction, loss, alteration, unauthorised disclosure of or access to personal data transmitted, stored or otherwise processed.

The contractor shall notify relevant personal data breaches to the controller without undue delay and at the latest within 48 hours after the contractor becomes aware of the breach. In such cases, the contractor shall provide the controller with at least the following information:

(a) nature of the personal data breach including where possible, the categories and approximate number of data subjects concerned and the categories and approximate number of personal data records concerned;
(b) likely consequences of the breach;
(c) measures taken or proposed to be taken to address the breach, including, where appropriate, measures to mitigate its possible adverse effects.

The contractor shall immediately inform the data controller if, in its opinion, an instruction infringes Regulation (EU) 2018/1725, Regulation (EU) 2016/679, or other Union or Member State or third country applicable data protection provisions as referred to in the tender specifications.

The contractor shall assist the controller for the fulfilment of its obligations pursuant to Article 33 to 41 under Regulation (EU) 2018/1725 to:

(a) ensure compliance with its data protection obligations regarding the security of the processing, and the confidentiality of electronic communications and directories of users;
(b) notify a personal data breach to the European Data Protection Supervisor;
(c) communicate a personal data breach without undue delay to the data subject, where applicable;
(d) carry out data protection impact assessments and prior consultations as necessary.

The contractor shall maintain a record of all data processing operations carried on behalf of the controller, transfers of personal data, security breaches, responses to requests for exercising rights of people whose personal data is processed and requests for access to personal data by third parties.

The contracting authority is subject to Protocol 7 of the Treaty on the Functioning of the European Union on the privileges and immunities of the European Union, particularly as regards the inviolability of archives (including the physical location of data and services) and data security, which includes personal data held on behalf of the contracting authority in the premises of the contractor or subcontractor.

The contractor shall notify the contracting authority without delay of any legally binding request for disclosure of the personal data processed on behalf of the contracting authority made by any national public authority, including an authority from a third country. The contractor may not give such access without the prior written authorisation of the contracting authority.

The duration of processing of personal data by the contractor will not exceed the period referred to in Article 12.10 of these general conditions. Upon expiry of this period, the contractor shall, at the choice of the controller, return, without any undue delay in a commonly agreed format, all personal data

processed on behalf of the controller and the copies thereof or shall effectively delete all personal data unless Union or national law requires a longer storage of personal data.

For the purpose of Article 7 of these general conditions, if part or all of the processing of personal data is subcontracted to a third party, the contractor shall pass on the obligations referred to in the present article in writing to those parties, including subcontractors. At the request of the contracting authority, the contractor shall provide a document providing evidence of this commitment.

* * *

TECHNICAL SPECIFICATIONS

REHABILITATION OF SAUDI MATERNITY HOSPITAL AT KASSALA - K_05

Reference:

SDN 13 – CUP J89D16003130006– CIG: Z452C78D56

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1 GENERAL

1.1 Introduction

These specifications cover the civil works as shown on the drawings and listed in the Bills of Quantities and shall be read in conjunction with the Contract Documents as listed in volume 1, Instructions to Tenderers.

All references given are intended solely for the convenience of those using the above documents and shall be in no way exclude the application of the other clauses in the documents which may, in the opinion of the Engineer have any bearing on the point in question.

1.1.1 Location

The works are situated in Port Sudan , Sudan

1.1.2 Scope of Works

The scope of the works is described in Volume 1 and in the specific drawings.

1.2 Extent of Contract

The works to be executed under this Contract comprise of:

Please refer to the Tech. documentation and design documents included in the Tender dossier

1.3 Precedence of Contract Documents

Should the provisions of any clauses of any or all of the Contract Documents to be shown to be mutually at variance or exclusive, the following order of precedence shall be applied in order to establish which of the said provisions, mutually at variance or exclusive, shall be deemed to be true and correct intent of the Contract entered into by Employer, and the contractor shall forthwith be absolved from any liability under the provisions not so proved to be the true and correct intent of the Contract, provided that in the execution of the Contract the contractor has, or shall have complied with such true and correct intent.

(i) Provision of the Standard or special Specifications shall take precedence over those of the General Conditions of Contract.

(ii) Provision of the Special Specifications shall take precedence over the Standard specifications unless otherwise indicated.

(iii) Details shown or noted on the Contract drawings shall take precedence over the requirements of both the Standard and the Special Specifications.

(iv) Detail Drawings shall take precedence over General Drawings.

(v) Within the Standard Specifications, the provisions of any section particular to the provisions at variance shall take precedence over the General Section, and within any section clauses particular to the provisions at variance shall take precedence over those not so particular. The foregoing order of precedence shall apply also to sections and clauses of the Special Specifications.

(vi) Where there is conflict in units of measurement quoted in Standard Specifications and units quoted in Bills of Quantities the units in latter will apply.

Notwithstanding any fore-written provisions, should the application of the foregoing order of precedence fail to resolve any variance or mutual exclusions as to the true and correct intent of the Contract to the satisfaction of the Engineer, the Engineer may exercise the right to arbitrarily give a ruling as to the true and correct intention of the Contract, and the Contractor shall have the right to claim additional payment for any additional expense incurred by him as a consequence of such variance or exclusion and arbitrary ruling.

1.4 Standards.

In the specifications, Bills of Quantities, and Drawings reference has been made to relevant International Standard Organisation (ISO) Specifications and Codes of Practice - to which the materials and workmanship should comply with.

Mixture of different Standards in one trade will not be allowed. For instance, if pipes are to be provided to I.S.O Standard, then all the pipes in the works are to be to I.S.O. Standard.

Where the dimension in one standard does not completely correspond to the dimension of the other standard, which is being used for construction of works, ruling of the Engineer will be sought and any decision given by the Engineer will be final and binding upon the Contractor.

1.5 Quality of Materials and Workmanship

The materials and workmanship shall be of the best of their respective kinds and shall be to the approval of the Engineer" shall be deemed to be included in the description of all materials incorporated in the Works, whether manufactured or natural, and in the description of all operations for the due execution of the Works.

All materials shall be of approved manufacture and origin and the best quality of their respective kind, equal to sample and delivered on to the Site a sufficient period before they are required to be used in the Works to enable the Engineer to take such samples as he may require for testing or approval, and the Contractor shall furnish any information required by the Engineer as to the quality, weight, strength, description, etc. of the materials. No materials of any description shall be used without prior approval by the Engineer and any condemned as unfit for use in the Works shall be removed immediately from the Site by, and without recompense to, the Contractor.

1.6 Trade Names

Trade Names and Catalogue References are given solely as the guide to the quality and alternative manufacturers of the materials or goods of equivalent quality will be accepted at the discretion of the Engineer.

1.7. Samples

Samples of all materials shall be deposited with the Engineer and approved prior to ordering or delivery to site. The engineer reserves his right to test any sample to destruction and retain samples until the end of the maintenance period. No payment will be made for samples and the Contractor must in the rates of prices allow for costs of samples. All materials delivered to site shall be equal or better in all respects than the samples delivered to the Engineer.

All sampling of materials on the site must be done by or in the presence of the Engineer. All other samples will be deemed not to be valid under the Contract.

All material delivered to the site or intended for the works not equal or better than the samples approved by the Engineer shall be removed and replaced at the Contractor's expense.

1.8 Testing.

As provided in clause 36 of the Conditions of Contract and in accordance with the specification quoted for any material used on works of this contract, tests may be called upon by the Engineer to be carried out at the place of manufacture or on the site. The contractor may assume that the tests will be required on soils, workmanship, and materials whether natural or manufactured to verify their compliance with the specifications. Samples of all such materials and manufactured articles together with all necessary labour, materials, plant and apparatus for sampling and for carrying out of the tests shall be supplied by the Contractor at his own expense.

A prime cost item has been included in Bills of quantities for testing of materials and workmanship as directed by the Engineer at the Independent Laboratory. The contractor will be reimbursed receipted cost of testing carried out by the laboratory if the workmanship or materials pass the tests. However, if the 1/4 result of tests shows that material is defective, then the Contractor will bear the cost of testing.

1.9 Programme for the Execution of Works.

(i) In accordance with clause 14 of the conditions of contract, Contractor upon receiving Engineer's order to commence shall within 30 days draw up a working programme setting out order in which the works are to be carried out with appropriate dates there-of together with delivery dates for materials. The Contractor shall together with his work programme supply an expenditure chart showing monthly anticipated expenditure.

(ii) The programme shall be deemed to have taken into account normal variations in climatic conditions to provide for completion of the works in the order and within the times specified there-in.

(iii) The order in which it is proposed to execute the permanent works shall be subject to adjustment and approval by the Engineer, and Contractor's price shall be held to include for any reasonable and necessary adjustment required by the Engineer during the course of the works.

(iv) The Contractor shall carry out the Contract in accordance with the programme agreed with the Engineer, but he shall in no manner be relieved by the Engineer's approval of the programme of his obligations to complete the Works in the prescribed order and by the prescribed completion date and he shall from time to time review his progress and make such amendments to his rate or executions of the works as may be necessary to fulfil these obligations.

(v) Once the proposed programme is approved by the Engineer, the contractor shall not depart from the programme without the written consent of the Engineer. In the event of unforeseen difficulties or disturbances arising, which force the Contractor to depart from the approved programme of Works, he shall advise the Engineer in writing of such occurrences without delay and submit proposals for any necessary remedial measures, for which he shall obtain the Engineer's approval before putting such measures into effect.

1.10 Substantial (Practical) Completion.

Substantial or Practical Completion of Works is to be understood as a state of completion, which leaves out only minor outstanding items that can be readily completed within a period of less than 1 month without interfering with the normal operation of the Works.

The works will not be considered as substantially or practically completed without the works being capable of being used by the Employer in accordance with the purpose of the works. This means amongst other things, that all final tests have been carried out, the pumping stations and treatment plant fully operational to the required capacity, all storage tanks filled up, operation manuals provided, and clearance of the site upon completion of the works has been carried out, all to the satisfaction of the Engineer.

The Contractor shall allow for a period of one month for the completion by others of as built drawings before the works are handed over to the Employer.

1.11 Nominated Sub-Contractors and Nominated Suppliers.

The Contractor shall be responsible for Nominated Sub-Contractor in every respect. In particular, it shall be the Contractor's responsibility to ensure that each sub-Contractor commences and completes the work in a manner so as to conform to the working programme, as specified above.

It is also the responsibility of the Contractor to ensure a satisfactory progress of the works and to ensure that the works are completed to a standard satisfactory to the Engineer.

The Contractor shall accept liability for and bear the cost of General and Specific Attendance on Nominated Sub-Contractors which shall be deemed to include for:

(i) Allowing the use of standing scaffolding, providing special scaffolding, maintenance and alteration of all scaffolding, retention of all scaffolding until such time as all relevant Sub-Contractor's works are complete and removal of all scaffolding on completion.

(ii) Providing equipment and labour for unloading and hoisting sub-Contractor's materials.

(iii)Providing space for office accommodation, and for storage of plant and materials; allowing use of sanitary accommodation; the supply of all necessary water, power, lighting and watching and clearing away all rubbish.

Cutting away for and making good after the work of Sub-Contractors as may be required will be measured and valued separately in the Bills of Quantities.

Before placing any orders with nominated sub-Contractors or nominated Suppliers, the Contractor should enter into an agreement with the nominated Sub-Contractor/nominated Suppliers to ensure that the conditions and delivery of materials to site comply with the Conditions of Contract and the working program.

Particular clause should be inserted in the agreement with the nominated Suppliers ensuring the validity of the rates for the supply of materials as per the delivery schedule.

Nominated Suppliers who are unable to meet the delivery schedule will not be given allowance for any increases in prices incurred after the delivery time agreed in the delivery schedule.

1.12 Entry upon Land, Working Site and Adjoining Lands.

The employer shall provide land, right of ways and way leaves for the Works specified in the contract.

If nothing else is mentioned, the Contractor will be allotted for execution of the works only the actual area as necessary for the extent of the construction.

The Contractor shall give notice to the Engineer at least 30 days before he wished to enter onto the land required to carry out the Contract. The Contractor shall not enter onto any land or commence any operations until such time as he receives formal confirmation from the Engineer that all necessary compensation formalities have been completed and that permission has been obtained from the landowner to enter the land and commence operations. Should the Contractor enters onto any land or commences operations without first obtaining this confirmation, he shall be liable in whole or in part, at the sole discretion of the Engineer, for all additional costs and/or legal charges which might arise therefore.

The Contractor shall on his own accord obtain rights of admission, and Rights of using all other areas, which are necessary for storing and manufacturing, or for setting up site offices and Resident Engineer's office or whatsoever will be necessary.

No separate payment will be made to the Contractor on account of these items and the Contractor must make due allowance for them in his rates.

The Contractor shall take care to prevent injury, damage and trespass on lands, fences and other properties near and adjacent to the Works and must in this connection make all necessary arrangements with adjoining landowners, or into the case of Government Property with officers appointed for this purpose, and ensure the Workmen's observance of all Government rules and Ordinances regarding game protection and other matters and provide, maintain and clear away on completion of the Works, all temporary fencing which may be required for execution of the Works.

Before completion of the Works, the Contractor must make good or compensate any such injury, damage or trespass on Lands, fences and other properties which have no otherwise been provided for in the Contract.

1.13 Preservation of Survey Beacons.

Ordinance Survey Beacons, Benchmarks, etc., or around the site of the Works shall not be disturbed unless permission has been obtained by the Engineer

In the event of unauthorised disturbance of such beacons, benchmarks, etc., in the course of the Works being carried out, the Contractor shall be responsible for reporting same to the Engineer, and for payment of any fees due for replacement of such disturbed beacons, benchmarks, etc. The contractor shall not replace such disturbed beacons benchmarks, etc. on his own accord.

1.14 Land for Camp sites.

The employer shall make available free of charge to the Contractor all land on under or through which the works other than Temporary Works are to be executed or carried out all as indicated onto the Drawings or as detailed in the Specifications. Such land shall exclude land for Resident Engineer's offices and the land required by the Contractor for his won camps, offices, houses, temporary works or any other purpose.

1.15 Existing Services.

Drains, pipes, cable and similar services encountered in the course of the Works shall be guarded from damage by the Contractor at his own costs to safeguard a continued uninterrupted use to the satisfaction of the owners thereof, and the

Contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services.

If the interest of the work shall, in the opinion of the Engineer, so require, the Contractor shall on the Engineer's direction arrange for the construction of permanent or temporary diversions of the said drains etc., together with reinstatement if temporary by the respective Department, Bodies, Corporations or Authorities and the cost of such works or diversions including reinstatement shall be charged against the appropriate provisional Sum provided in the Bills of Quantities. The Contractor shall be at liberty, subject to the approval of the workers, to bear the cost of reinstatement of the additional diversions. No services may be tampered with by the Contractor and all works in connection with any kind of services shall be carried out by their respective owners.

It is the responsibility of the contractor to inform the engineer immediately any existing service is exposed.

1.16 Damage to Services.

The Contractor shall be held liable for all damage and interference to mains and pipes, to electric cables or lines of any kind either above or below ground caused by him or his sub-Contractors in execution of the Works, whether such services are located on the Contract Drawings or not. The Contractor must make good or report to the appropriate authorities the same without delay and do any further work considered by the Engineer or owner. The contractor shall provide for these contingencies in the rates inserted in the Bills of Quantities.

If the Contractor fails to reinstate the damaged services within the time considered as reasonable by the Engineer's Representative, then the Engineer's Representative shall be empowered to get the damaged services reinstated by any other contractor and charges there-of shall be deducted from any money due to the Contractor.

1.17 Temporary Roads and Traffic Control.

The Contractor shall provide and maintain all temporary roads, bridges and other work required for the construction of the Works including access to quarries, borrow-pits, accommodation etc.

The Contractor shall provide and in his rates allow for all necessary temporary traffic control signs, barricades, beacons, fragment, lighting and watching required for the normal control of traffic.

1.18 Road Closure.

Where a road used by the Contractor for delivery of any material used In the works is closed under Section 71 of the Traffic Ordinance Act 1962, the Contractor shall obey such closure order and use alternative roads.

1.19 Road and Railway Crossing and Traffic Control

Wherever the pipeline is crossing the classified roads and railway line, the Contractor will contact the relevant authorities will in advance and obtain necessary permission to dig across the road and railway-line in accordance with requirement of the authorities concerned and shall pay any royalties connected with this work, and the Contractor will provide temporary detour road together with any warning signs necessary. There will be no separate payment for this and cost of all expenses connected with road and railway crossing for which no separate items have been included in the Bills of Quantities.

1.20 Protection from Water.

Unless otherwise mentioned, the Contractor shall keep the whole of the Works free from water and allow in his rates for all dams, coffer dams, pumping, piling, shoring, temporary drains, slumps, etc., necessary for this purpose and shall make good at his own costs all damage caused thereby.

1.21 Weather Conditions.

The Contractor shall be deemed to take into account all possible weather conditions when preparing his tender and he shall not be entitled for extra payment by the reason of the occurrence or effect of high winds, excessive rainfall, temperature or any other meteorological phenomena.

1.22 Protection from Weather.

All materials shall be stored on site in a manner approved by the Engineer's Representative and the Contractor shall carefully protect from the weather all works and materials which may be affected thereby. No separate payment will be made for this and Contractor will allow in his rates for this.

1.23 Explosives and Blasting.

At works requiring the use of explosives, the Contractor shall employ men experienced in blasting, and these men must be in possession of a current blasting certificate. The purchase, transport, storage and use of explosives shall be carried out in accordance with the most recent Explosives Ordinance and Rules issued by the Government and the Contractor shall allow in his rates for excavation and quarrying for all expenses incurred in meeting these requirements, including the provision of suitable stores. Blasting operations shall be carried out with as little interference as possible to traffic or persons and the rates shall include for all flagging, watching, barricades and clearance of debris.

In all cases previous permission from the Engineer must be obtained before commencing any blasting operation.

If, in the opinion of the Engineer, blasting would be dangerous to persons or property, or it is carried out in a reckless manner, the Engineer can prohibit any further use of explosives.

1.24 Liaison with Police, etc.

The Contractor shall keep himself in close contact with the Police, Labour Officers and other officials in the areas concerned regarding their requirements in the control of workmen, passage through townships, or other matters and shall provide all assistance and/or facilities, which may be required by such officials in execution of their duties in connection with the Works.

Any instruction given by the Traffic Police concerning fencing off of open trenches or other excavations must be followed explicitly.

1.25 Provision of Water.

The Contractor shall provide water for use in the Works. He shall supply all hydrants, hose, cocks, vessels and appliances necessary for the distribution there-of and shall provide pumps, tanks, carts, vessels and appliances, transport and labour when and where-ever it is necessary for water to be carted for use at the Works. All water used in connection with the Works shall if possible be obtained from a public water supply and the Contractor shall make all necessary arrangements and pay all the charges for connections to main and for water used.

1.26 Temporary Lighting and Power.

The contractor shall provide all artificial lighting and power for use on the Works, including all sub-contractors and Specialists' requirements and including all temporary connections, wiring, fittings, etc., and clear away on completion. The Contractor shall pay all fees and charges and obtain all permits in connection there-with.

1.27 Sanitation.

The Medical Officer of Health or other Sanitary Authority shall be informed when Works are contemplated and when Works are about to commence. The instructions of the Medical Officer or other Sanitary Authority shall be complied with by the Contractor at his own expense.

The site shall be kept in a clean and proper sanitary condition. No nuisance shall be committed on or around the work, and latrines for the workmen and staff shall be provided in accordance with the requirements of the Medical Officer or Sanitary Authorities. The Contractor shall be responsible for the sanitary discipline of his labor.

The Engineer's Representative has the right to order any laborer, who in the opinion of the Engineer's Representative does not have a satisfactory sanitary discipline, off the site with immediate effect.

The Contractor shall make sure that his personnel working on the site are medically fit, and he shall bear the cost of any medical test required to determine that his personnel are free from infectious diseases.

The Contractor shall follow the safety rules set down by the Factories Inspectorate, Ministry of Labor.

1.28 Medical Facilities.

Contractor's attention is drawn to Legal Notice No. 79 of 22ndSeptember 1978 by which it is mandatory that every Contractor employing more than twenty people should appoint (in writing) a safety supervisor. A safety supervisor advises the management on all matters regarding safety, hygiene and welfare of the people affected by the Contractor's undertaking on the site. The safety officer may in addition carry out other duties.

The contractor shall provide adequate first-aid equipment on the site, and ensure that at least two of his site staff are competently trained in first aid.

1.29 Signboards

The Contractor shall erect signboards as shown on the drawings in prominent positions adjacent to the Works to the satisfaction of the Engineer.

1.30 Setting Out

The Contractor must before commencing any construction works, make sure that levels shown on the drawings correspond with levels found on the site.

Should any discrepancy be discovered between the levels shown on the drawings and those found on the site, which may affect the levels and dimensions of any part of the Works, the Contractor shall notify the Engineer, who if necessary, will issue drawings showing the amended levels and dimensions.

The Contractor shall allow for in his rates, the cost of the necessary qualified and experienced staff to set out the works and during the continuance of the Contract for the sole use of the Engineer; provide approved new and accurate instruments together with all other requisites, all necessary chairmen and other attendance and transport required for setting out and checking the Works or purposes in connection therewith.

The contractor shall clear the site and set out the Works well in advance to enable the Engineer.

inspect and approve the setting out prior to commencement of the Works. The Contractor shall amend at his own cost any error due to inaccurate setting out.

Any checking or approval by the Engineer of the setting out, benchmarks, plans or schedules will not relieve the Contractor of his responsibilities under the Contract.

The Contractor shall provide a site plan showing the position of his site offices, storage sheds, accommodation, Engineer's Representative's office etc., in relation to the permanent works for the approval of the Engineer before commencing erection of his camp.

1.31 Backfilling of Holes and Trenches.

The contractor shall immediately upon approval of any work at his own expense and to the satisfaction of the Engineer Backfill all holes, trenches and temporary quarries which have been made (except permanent borrow pits), level all mounds or heaps of earth that may have been raised or made and clear away all rubbish caused by the execution of the work. The Contractor shall bear and pay all costs, charges, damages, and expenses of any kind whatsoever which may occur by reason of holes and trenches connected with the Works or materials, tools or plant being left or placed in improper situation.

1.32 Inspection of Works

No part of the Works shall be built in or covered over until it has been inspected and approved by the Engineer and the Contractor must give due notice in writing to the Engineer's Representative when any part of the Works are ready for inspection.

1.33 Method of Measurement.

All measurements shall be taken jointly by the Contractor and the Engineer as and when the latter so directs and shall be made in accordance with the Specifications and Preamble to Bills of Quantities notwithstanding local or other customs.

1.34 Cleaning Up of Site

Before final acceptance upon the completion of the Works, the Contractor shall, at his own expense, remove and dispose of all rubbish and remove all equipment, surplus materials, camps and buildings, which the Contractor has provided, and temporary works ordered by the Engineer and shall leave the Site absolutely clear thereof and in good order and condition to the entire satisfaction of the Engineer.

1.35 Testing of Water-Retaining Structures.

All water-retaining structures shall on completion be tested for water tightness in the following manner. The structure shall be filled with potable water in stages and held at each stage for such time as the Engineer may require. Should any dampness or leakage occur at any stage, the water shall be drained off and the defects made good. The procedure shall be continued and finally the structure shall after a period allowed for absorption remain full for seven days. Within those seven days, the level of the surface of the water should be recorded and measurements made at intervals of 24 hours.

The total leak must not exceed 0.3% of the total volume of water in the tested structure.

If the structure does not satisfy the conditions of the test, and the daily drop in water lever is decreasing, the period of test may be extended for a further 7 days, and if the specified limit is then not exceeded, the structure may be considered as satisfactory.

Should any dampness or leakages or other defects occur they shall be made good and the structures re-tested until the water tightness is approved by the Engineer.

Faces of submerged structures may not be covered before testing.

The Contractor shall allow in his rates for all expenses and shall provide water and all necessary labour and materials for testing the structure.

1.36 Testing of Roofs.

Where structures are used for the storage of potable water, adequate precautions should be taken to ensure that the roof is watertight in order to give protection against a potential source of pollution.

The roof should be tested by lagooning the concrete slab to a minimum depth of 75 mm for a period of 3 days; the roof slab should be regarded as satisfactory if no damp patches occur on the soffit. The roof screed should be completed immediately after testing.

All water, labour and materials for the test are to be provided by the Contractor who shall allow for this in his rates.

1.37 Cleaning and Sterilizing Water-Retaining Structures

The interior of all potable water-retaining structures shall be thoroughly cleaned and washed after the water-tightness test has been approved by the Engineer in order to remove all contamination.

The structure shall then be filled to overflow level with clean water containing 50 parts per million of chlorine and left for a period of at least 24 hours. The chlorinated water shall then be drained away and the structures refilled with clean water

from which samples shall be taken for bacteriological examination and for tests of residual chlorine. If any of the results of the tests are unsatisfactory when compared with those of the control sample of the supply water, the sterilizing process shall be repeated until the results of the tests are satisfactory.

The costs of the initial sampling, analyses and preparing reports on the bacteriological quality of the water shall be borne by the Employer, but should the initial reports be unsatisfactory, the costs of any subsequent sampling analysis and preparing reports shall be borne by the Contractor.

The Contractor shall allow for - in his rates: providing water, all labour, materials, chemicals and other things necessary for cleaning and sterilizing the water-retaining structures.

1.38 Contractor's Superintendence.

The contractor shall give or provide all necessary superintendence during the execution of the works and as long thereafter as the Engineer may consider necessary for the proper fulfilling of the Contractor's obligations under the Contract. The Contractor or his competent and authorized Agent or Representative approved in writing by the Engineer (which approval may at any time be withdrawn) is to be constantly on the Works and shall give his while time to the superintendence of the same. If such approval shall be withdrawn by the Engineer, the contractor shall after receiving written notice or such withdrawal, remove the Agent from the Site within the time stated in the notice and shall replace him by another Agent approved by the Engineer.

1.39 Transport of Workmen

The Contractor shall include in his rates for all transport of staff and workmen to and from and in connection with the various parts of the Works, and all costs incurred in recruiting and transporting labor to the site, where such labor is from outlying areas and costs of returning labor on termination of the Contract.

1.40 Normal Working Hours.

These shall be taken as Monday to Friday 8.00 a.m. to 5.00 p.m. with all Public Holidays set aside as required.

Where the Contractor wishes to work outside these hours, he shall request the Engineer in writing at least 24 hours in advance for consideration.

1.41 Transport, Travelling and Leave

In his rates, the Contractor shall allow for and be responsible for all charges which may arise out of the transport to the Site of materials, plant or equipment from any source, all applicable customs duties, all licenses or other costs whatsoever together with all handling, packing and insurances. The prices shall also include all charges arising out of the provision of transport to the site of staff and labour from any source and shall include all costs in respect of fares, insurances, customs, medical or other fees, subsistence, leave and all other matters.

1.42 Compliance with Statutes and Regulations.

In addition to requirements of Clause 26 of the General Conditions of Contract, the Contractor shall be responsible for acquainting himself with all current valid Statute Ordinance or Bye-Laws or Regulations which may affect the works and shall include these in the item provided in the Bills of Quantities. This applies to Training Levy and other similar taxes for which no claims on the part of the Contractor other than the one inserted in the Bills of Quantities will be allowed.

1.43 Accommodation for Workmen

The Contractor shall provide and maintain suitable shelters and mess facilities for his workmen and supervisory staff. The facilities shall be of sufficient size and to a standard considered Satisfactory by the Engineer.

The Contractor shall throughout the contract provide an adequate supply of potable water for the workmen.

1.44 Storage Spaces and Sheds

Suitable temporary stores and workshops shall be erected and later removed on completion of the works. All buildings shall be adequate for protection of the equipment or materials to be kept there-in and shall be constructed and located to the satisfaction of the Engineer.

1.45 Office for Contractor.

The Contractor shall erect an office near the Works on a site to be approved by the Engineer. This office shall be kept open at all hours during which the work is in progress.

Any notice to be given to or served upon the Contractor shall be deemed and taken to be effectively given or served upon by the delivery there-of at such office on the Site.

1.46 Office for the Engineer's Representative.

The Contractor shall for the Engineer's Representative supply and maintain an office of weather-proof construction, provided with burglar-proofed windows and suitably insulated against head and cold, all to the satisfaction of the Engineer

in respect of construction and design. The office shall have at least 3 separate rooms. The internal measurements of the rooms will not be less than 4 m x 6 m for one of them and 3 m x 4 m for the remaining three. A clear inside height of not less than 2.5 m will be provided for all the rooms. The floor shall be of floated concrete or raised timber adequately damp, ant- and termite-proofed. The office shall be painted inside and outside with approved paint. Pin-boards shall be provided in all offices.

The office of the Resident Engineer shall be separated from that of the Contractor and the Contractor shall be liable and responsible for the Security of all papers and equipment contained in the office and shall supply all necessary stationery listed below.

The office shall be sited to the satisfaction of the Engineer's Representative, and if the Contractor moves his own main site office during the course of the Contract, he shall also move the Engineer's Representative's office to a site approved by the same without additional payment.

Toilet and washroom facilities, which will be conveniently attached to the offices to the satisfaction of the Engineer, together with a potable water supply and water-borne sewage disposal shall be provided for at the office. Provision of toilet paper, soap and towels and cleaning of the above toilet and washroom together with the Engineer's Representative's office, shall be the responsibility of the Contractor, and has to be carried out at least once every day. No extra payment will be considered for cleaning and provision of towels, etc.

New furniture and equipment purchased from an approved furniture manufacturer including, but not limited to the following, shall be provided:

2. SITE CLEARANCE

2.1 Clearance of Trees, Bushes, Scrub, Huts, etc.

The contractor shall unless otherwise directed cut down all trees, remove bushes, plantations, crops and other vegetable growth and grub up all roots, take down all huts, buildings, walls fence and any other obstruction except services mentioned in clause 1.13 and handle and transport salvaged usable materials, to a site approved by the Engineer. All salvaged and usable materials are the property of the respective owners. The clearing and demolition here-in described shall be carried out to a width of the minimum excavation plus 1.50 m on either side.

With exception of the salvaged material fore-mentioned, the Contractor shall destroy or otherwise remove the whole of the rubbish from the site to an approved tip or number of tips provided by him.

Trees shall be cut down to as near the ground level as possible and the rates entered in the Bill of Quantities shall include for cutting down, removing branches and foliage, cutting into suitable lengths, grubbing up stumps and roots, stacking up, burning or disposing of as directed.

Before commencing any site clearance, general clearance, clearance of pipelines etc., the Contractor shall inform the Engineer's Representative of his intention. The Engineer's representative will by visiting the section of works concerned, determine the extent of the clearance expressly required.

Payment for clearance will be authorized on the basis of what is expressly required and at the discretion of the Engineer's Representative.

2.2 Damage to Lands, etc.

Except where necessary for the proper execution of the Works, the Contractor shall not interfere with any fence, hedge, trees, land or crop forming the boundary of the site, or elsewhere. In the event of any interference, the Contractor shall make good any damage to such fence, hedges, tree, land or crop to the satisfaction of the Engineer and the owner there-or.

Where the work is to be executed in private land, the Employer will be responsible for negotiating and obtaining rights of way and the serving of all notices as may be required upon the owners and/or occupiers of the land and it shall be the obligation of the Contractor to keep the Employer and the Engineer fully informed concerning the rate of progress and of his intention to enter and begin work within any way leave as provided for under the Condition of Contract and required by this Specification.

2.3 Clearing the Site on Completion.

On completion of the Works, the Contractor shall clear the Site of all plant, building, spoils, dumps, rubbish, etc. and leaves the Site to the satisfaction of the Engineer.

Borrow pits and temporary quarries shall be made good and covered with vegetable soil. Dump[s for waste material shall be covered with at least 0.5 m of soil of which at least a 0.10 m layer in top shall be vegetable soil.

3. EARTHWORKS.

3.1 General.

Excavation shall be made to such lengths, depths and inclinations as may be necessary for the construction of the works or as shown on the drawings or as the Engineer may direct.

3.2 Definitions of Materials.

For the purpose of these Specifications, materials of earthworks are defined as follows:

a) Rock: A solid mass of mineral material, exceeding 0.25m down with a hard-drifting pick. Cubic metre in volume, of such hardness and texture that it cannot be broken

b) Common Material: All earth materials, which do not meet the requirements of rock as defined in "Rock" above.

3.3 Classification of Excavation.

The Engineer or his Representative and the Contractor or his Representative shall be present during classification of materials.

Where the terms "rock excavation" and "common excavation" or "excavation" are used in these specifications, the following definitions shall apply.

3.3.1 Rock excavation

Rock excavation includes all solid rock in place, which cannot be removed until loosened by blasting, barring, wedging, and all boulders or detached pieces of solid rock more than 0.25 cubic metre in volume. Solid rock under this class, is defined as sound rock of such hardness and texture that it cannot be loosened or broken down by hand-drifting picks.

All materials containing more than 50 per cent by volume of boulders exceeding 0.25 cubic metre in volume shall be classified as rock excavation.

3.3.2 Common Excavation.

Common excavation includes all material other than rock excavation: including, but not restricted to earth, gravel, and also such hard and compact material as hardpan, cemented gravel, and soft or disintegrated rock together with all boulders or detached pieces of solid rock not exceeding 0.5 cubic meter in volume.

3.3.3 Measurement.

Payments will be made in accordance with the above classifications, and no additional allowance will be made for materials being wet or dry.

3.4 Stripping of Topsoil

3.4.1 Stripping

Stripping shall consist of removing transporting and disposing of topsoil, stumps, roots, buried logs, debris, humus and similar objectionable matter.

Areas to be stripped are all areas required for permanent constructional works, borrow-pits and embankment fills.

The limits of stripping shall extend 2 metres beyond the limits of excavation or toes of fills.

The depth of stripping shall normally be 0.2 m, but deeper stripping might be needed to remove stumps.

3.4.2 Disposal

Materials from stripping suitable as topsoil shall be attacked in approved areas. All other non-combustible materials shall be buried in approved disposal area; covered with a minimum of 0.5 m of excavation spoil. These disposal areas shall be left with neatly graded surfaces and stable slopes that assure drainage. Alternatively, the non-combustible material shall be removed from the area by the Contractor.

3.4.3 Measurement

Stripping is measured as horizontally stripped area in square metres.

3.5 Excavation in Open Cut.

3.5.1 General

All open cut excavation shall be performed in accordance with this section to the lines, grades and dimensions shown on the drawings or

as directed by the Engineer. The Engineer reserves his right to at any time during the progress of the work to vary the slopes or dimensions of the excavations from those previously specified.

All necessary precautions shall be taken to preserve the material below and beyond the lines of all excavation in the soundest possible condition. Any damage to the works due to the Contractor's operations, including shattering of the material beyond the required excavation lines, shall be repaired at the expense of and by the Contractor.

Any and all excess excavation for the convenience of the Contractor for any purpose or reason, except as may be ordered in writing by the Engineer and whether or not due to the fault of the contractor shall be at the expense of the Contractor. Where required to complete the work, all such excess excavation and over-excavation shall be filled with compacted concrete Grade 10 furnished and placed at the expense of and by the Contractor.

All excavation for structure foundations shall be performed in the dry.

If excavations are carried out in roads, footpaths, separators, or within 5 m of buildings, the contractor is requested to execute the work in a way that will minimise damage and disturbances.

In general vertically sided excavation will be required in such places and the necessary timbering or other support must be provided.

Undercutting of excavation sides will not be permitted.

The Engineer reserves his right to direct the contractor as to the lengths of trenches or parts of bulk excavations, which shall be opened up at any one time.

In the case of excavations in roads, and in other cases which in the opinion of the Engineer are likely to cause interference to the public, the Contractor shall organise his operations in such a way as to reduce to a minimum the interval between opening up and backfilling the excavations.

No permanent work shall commence until the Engineer has inspected and approved the excavation

3.5.2 Rock Excavation

The Contractor shall notify the Engineer on each occasion when he considers that he is entitled to payment of excavation in rock and shall not fill in any excavation concerned, until it has been inspected by the Engineer.

No payment for excavation in rock shall be made unless the Engineer has inspected the excavation and certified in writing the quantities involved.

The Contractor shall trim all rock faces in cuttings to accord with the dimensions shown on the drawings and upon completion leave them safe from rock falls to the satisfaction of the Engineer.

On any work requiring the use of explosives, the Contractor shall employ men experienced in blasting - and these men must be in possession of a current blasting certificate.

The purchase, transport, storage and use of explosives shall be carried out in accordance with the most recent Explosives Ordinance and Rules issued by the Government, and the Contractor shall allow in his rates for excavation and quarrying, for all expenses incurred in meeting these operations shall be carried out with as little interference as possible to traffic or persons and the rates shall include for all flagging, watching, barricades and clearance of debris, and the Contractor shall take all practical precautions for the protection of persons, properties and the Works. Slopes shattered or loosened by blasting shall be taken down at the expense of and by the Contractor.

The Contractor's blasting and other operations in excavation shall be such that they will yield as much suitable material as possible for the construction.

3.5.3 Foundation for structures.

(a) Common material: The bottom and side slopes of common material upon or against which concrete is to be placed shall be finished accurately to the established lines and grades, and loose materials on surfaces so prepared shall be moistened with water and tamped or rolled with suitable tools and equipment to form a firm foundation for the concrete structure. If, at any point in common material, material is excavated beyond the established excavation lines, for any reason except by written orders from the Engineer, then the over-excavation resulting voids shall be filled with consolidated concrete Grade 10 at the Contractors expense.

If the excavation is carried out in advance a protective layer of 150 mm thickness shall be left above the foundation level until immediately before the Contractor is ready to pour the blinding concrete.

(b) Rock Materials: The bottom and side slopes of rockmaterial upon or against which concrete is to be placed shall be excavated to the required dimensions as shown on the drawings or established by the Engineer. No material will be permitted to extend within the neat lines of the structure. If, at any point in the rock material, material is excavated beyond the limits required to receive the structure, the additional excavation shall be filled solidly with concrete Grade 10.

All soft or loose material shall be removed by the use of stiff, brooms, picks, hammer or jets and any cavities backfilled with concrete Grade 10, grout or compacted rock fill as directed.

(c) Levels and Dimensions of foundations: Levels anddimensions of foundations shown on the drawings may be changed by the Engineer after excavation has taken place.

The additional volume shall be measured net and paid according to the rates in the Bills of Quantities.

3.5.4 Trench Excavations.

All surface material including top soil which differs in any nature whatsoever from the sub-strata, shall in every case be carefully set aside and stored separately from other excavated material. No extra claim will be allowed for setting aside surface mater or topsoil for later use.

Trench excavation shall be carried out with great care, true to line and gradient and as near as practicable to the size required for construction of the permanent work. Nowhere shall the external dimensions of the excavations be less than the dimensions of the permanent work shown on the Drawings or ordered by the Engineer.

Excavation for pipe trenches shall be of sufficient depth to give a minimum cover of 650 mm over the top of the pipe.

Where the pipeline is required to be laid at depth, which does not satisfy the minimum cover conditions set out above, the ground surface shall be brought up to the required level by banking the backfill or as directed by the Engineer.

Where timber has been used in excavations any of such timber left in position shall be at the expense of 3/5 the Contractor except where the Engineer has ordered the timber to be left in place or if any timber should be left in place with the prior approval of the Engineer. The timber approved or ordered to be left in place will be paid for at the rates entered in the Bills of Quantities.

For the purpose of this clause the words "timber" and timbering "shall be construed to include trench sheeting and steel or concrete sheet pilling or any other means adopted by the Contractor for supporting excavation.

3.5.5 Excavation to be kept Free from Water.

Where excavations are required below the existing water level, theContractor shall make arrangements to keep the excavation dry andshall produce drawings and written explanations of the method to be used to enable the Engineer to determine the adequacy of the method, before commencing the excavation.

The Contractor shall give due regard to the possibility of floods and provide all pumps, timbering, coffer dams, sheet piling and other equipment necessary or keeping the excavations free from water.

Every precautions hall be taken not to diminish the bearing capacity of the soil below foundation level. Well points or pump pits are to be outside the foundation area to prevent flows in upward direction.

All slumps and drains are to be filled in or otherwise made good as directed by the Engineer on completion of the relevant part of the Works.

The costs of all the above precautions shall be allowed for in the rates inserted in the Bills of Quantities.

3.5.6 Refilling Excavations.

No backfilling or refilling shall commence without the Engineer's approval.

The refilling of excavations shall be commenced as shown as practicable after the permanent works have been tested where so required and inspected and approved by the Engineer. In particular, the back filling of trenches shall be carried out expeditiously to reduce lengths of trenches open at any one time. As soon as P.V.C. or Polythene pipes are laid and jointed in their final positions, they should be protected from possible damage by carefully backfilling of fine granular material brought up to about 150 mm over the top of the pipe, for the full width of the trench, and well compacted. Joints must be left open for inspection until the pressure test is completed.

The minimum cover, where pipelines cross under roads, shall be 800 mm to the top of the surrounding concrete, or such cover as may be directed by the road authorities.

Where P.V.C. or Polythene pipes are being laid, the bottom of the trench must be completely free from stones, and a smooth bed of fine material must be provided. Where the bed of the trench for P.V.C. or Polythene pipes is excavated in rock, it must be excavated to a depth of not less than 50 mm below the bottom of the pipe, and refilled with selected fine granular material to make a smooth bed for the pipe.

The width of the trench to be excavated will depend on the size and type of pipe being laid. Sufficient width must be excavated to allow the pipe to be correctly bedded and aligned, and to allow for the joints to be correctly made. Generally, the grade of the pipe will conform to the lie of the ground, but the excavation must be deepened where necessary to avoid back falls in any section. Generally, the pipeline will slope down towards scour valves and up towards air valves. Minimum gradients are shown on the general drawings.

Any excavated material stored on site for backfilling or other purposes shall be deposited alongside the excavation at a minimum distance of 0.5 m in such a manner that it will cause no damage and as little inconvenience as possible.

3.5.7 Timbering of Excavations.

The Contractor shall supply and fix outside the limits of the permanent Works all the timber necessary for support of sides and bottoms of the excavations, for the security of adjacent structures and properties and for every other purpose for which it may be required, all to the satisfaction of the Engineer. The Contractor shall maintain such supports until in the opinion of the Engineer, the works is sufficiently advanced to permit the withdrawal of the support. Such withdrawal shall be executed only under the personal supervision of a competent foreman.

The Engineer may order excavations to be timbered or to be close timbered or may order timbering to be driven ahead of the excavation, or may order the adoption of any other method of supporting the sides and bottoms of the excavations as may appear to be necessary, and the Contractor shall adopt and shall make no charge for executing the adopted method.

The Contractor shall be responsible for any injury to the work and any consequential damage caused by or arising out of the insufficiency of the support he provides for his excavations or caused by or arising out of the removal of that support, and any advice permission, approval or instruction given by the Engineer relative to that support or removal thereof shall not relieve the Contractor of his responsibility.

Any instruction given by the Engineer will be directed to the provision of stronger support than that proposed by the Contractor, and will be given only when, in the opinion of the Engineer, the support proposed by the Contractor is insufficient.

Backfilling shall be executed with selected materials in 150 mm layers (300 mm layers of a mechanical hammer is used) each layer being well rammed and watered to obtain the maximum compaction. Care shall be taken to ensure that no stone or other material, which could damage pipes or other work , is placed within 300 mm of such work.

Water in excess shall not be used in settling of the backfilling.

Backfilling over steel pipes shall be generally as described above, except that the initial protective filling around the pipe is not necessary.

Regardless of the means of backfilling adopted, it is the Contractor's responsibility to ensure that he satisfactorily backfills all excavations and causes no damage to permanent work or adjacent structures, and he shall at his own expense take all steps necessary to comply with this obligation. 3/7 The Contractor shall at all times be responsible for damage caused to permanent work through his backfilling operations or throughout he premature opening to traffic of a backfilled surface.

3.5.8 Reinstatement of Surfaces.

Generally all trenches and backfilled excavations shall be reinstated to equal surface as before excavation.

Trenches in any existing road shall be refilled to the level of natural soil below the road with sub-soil in 75 mm layers, each layer being carefully tamped with rammers. The remaining top layer shall be filled to the road surface with materials equal in type, quantity and compaction to materials used for the existing road.

The trench shall then be left to settle for 30 days. At the expiration of this period, the surface shall be made up to level and tamped or rolled to the approval of the Engineer, who will decide on the particular surfacing employed in accordance with the existing surface of the road.

Before expiration of the maintenance period, the Contractor shall make good any defaults in reinstatements.

3.5.9 Removal of Surplus Excavated Material.

Excavated material, which is not needed either for backfilling trenches or other excavations or use in embankments or otherwise, shall be removed and disposed of to tipping places obtained by the Contractor. All rubbish and waste material shall similarly be removed by the Contractor. All Surplus excavated material shall be spread and levelled in the tipping places in accordance with such directions as the Engineer may give, and the Contractor's rates for disposal shall include for the costs of such operations.

The contactor shall take every practical precaution against causing any nuisance, damage, injury or inconvenience in the handling, stacking, carting or disposal of excavated materials or any other operation matter or thing in connection therewith. No excavated material shall be placed in any position here it may be washed away or may be liable to fall or spread into any private property or across a road or footpath, should such occur, the Contractor Shall forthwith remove the same at his own costs.

Should the Engineer direct the Contractor to tip certain surplus excavated materials in a particular place (other than the tipping places obtained by the Contractor) the Contractor shall abide by such instruction and shall make no charge in consequence thereof unless the place specified entails a longer haul than what would be incurred by tipping at the place or places obtained by the Contractor.

3.5.10 Measurement of Excavation Work.

Excavated material will be measure, in cubic metres in excavation to the lines shown on the drawings or described in these specifications and will include only material that is actually removed at the direction of the Engineer.

Where excavation lines are not shown on the drawings, the excavation will be measured to the most practicable lines, grades, and dimensions as directed by the Engineer.

In the case of bulk excavations, the Contractor shall unless otherwise directed by the Engineer prior to the commencement of any excavation prepare grid plans of the various sites showing the existing ground levels at intervals of not more than 10 m. For any particular part of excavation the mean ground level shall be determined from the aforesaid grid plan and the depth shall be calculated from the above mean ground level.

Pipe trenches are measured in linear metres as one item for each pipe size with a minimum width and depth as indicated on the drawings. Extra excavation for deeper trenches will be measured on cubic metres and paid for where ordered by the Engineer.

Rates for excavation shall include for all labour, equipment; preparation of bottoms for receiving concrete or granular soil beds; for forming joint holes where applicable, for preserving surfaces of excavation; for returning excavated material as rammed backfill and for carting away surplus to dump.

Rates for excavation shall also include for working in a manner that causes no interference with the stability of adjacent structures and properties; for the cost of all timber or other support left in place unless ordered or approved to be left in place by the Engineer: for ground stabilization by means of dewatering, chemical processes or other approved method whether affected by floods, storms or otherwise; for the provision and sealing of temporary channels, drains and dumps; for temporarily storing excavated materials required for backfill or other purposes; for temporarily supporting, protecting, diverting, maintaining utility services; for maintaining flows in sewers and water found necessary for the proper execution and safety of the works.

Further, the rates in the Bills of Quantities for excavation in open cut shall include the entire cost of:

a) Transportation of materials from the excavation to points of final use, to disposal areas, to temporary stockpiles, and from temporarily stockpiles to points of final use.

b) Rehandling excavated materials which have been deposited temporarily in stockpiles.

c) Removal of oversize materials from otherwise suitable materials and disposal of the same.

No extra payment shall be made to the Contractor for working in confined space or if the position of the Works as set out or ordered will not allow the use of mechanical excavators.

The 50% of the rate for excavation, backfilling and disposal of surplus materials will become due for payment when trenches have been backfilled to a depth of 150 mm over the pipe barrel.

Excavation for structure foundations will be authorized for payment of 50 % of the rate, when the excavation has been approved and the surface blinded.

3.6 Borrow Pits.

No borrow pits will be allowed to be opened on the site unless permission in writing has been obtained from the Engineer.

Before the excavation of an approved borrow area is commenced, the Contractor shall clear the surface and strip the topsoil in accordance with Clauses 2 and 3.4.

Borrow excavations shall be regular in width and shape and shall be properly graded and drained and finished with neatly trimmed slopes, and if so directed soiled and grassed.

The Contractor shall not be entitled to any additional allowance above the unit prices on account of any changes ordered by the Engineer in the amounts of materials to be secured from any borrow area, or on account of the designation by the

Engineer of the various portions of the borrow areas from which materials are to be obtained, or on account of the depths of cut which are required to be made.

Measurement for payment of excavation in borrow areas will only include for the quantities of materials utilized for construction of embankments etc. Any costs of excess excavated material, except if directed by the Engineer shall be borne fully by the Contractor.

3.7 Hardcore Filling.

Hardcore fill shall consist of clean hard broken stone or rubble with measurements not exceeding 150 mm in any one direction with sufficient murram added to fill the interstices. The hardcore shall be well packed, rammed and where possible rolled with a 5 ton roller.

Where rolling is impossible, compaction shall be by hand or by mechanical tampers. Before any concrete is laid on hardcore, the hardcore shall be levelled and blinded with fine stone chipping, rolled and watered as necessary. hardcore filling is measured after compaction.

3.8 Earth Filling.

3.8.1 General.

Earth not suitable to be used in filling may at any time be rejected by the Engineer. If there is a deficit of soil, the Contractor shall from approved borrow pits supply selected material in the ordered amount.

Before commencement of filling the topsoil shall be removed, if so ordered by the Engineer. The removal of this layer will be separately priced in the Bills of Quantities.

3.8.2 Compaction of Fill.

After removal of topsoil as specified, fill material shall be spread in even layers over the full width of the area to be filled. Each layer shall not exceed 150 mm in thickness after compaction.

The water content of the earth fill material prior to and during compaction shall be distributed uniformly 3/10 throughout each layer of the material. The allowable ranges of placement water content are based on design considerations. In general, the average placement water content will be required to be maintained at the Proctor Laboratory standard optimum condition. This standard optimum water content is defined as, "That water content which will result in a maximum dry unit weight of the soil when subjected to the standard Proctor Compaction Test".

Proctor compaction tests are to be carried out in accordance with BS 1377 and the Contractor shall provide the Engineer with facilities to carry out such tests, or cover the cost of tests carried out elsewhere.

As far as practicable, the material shall be brought to the proper water content in the borrow pit before excavation. Supplementary water, if required, shall be added to the material by sprinkling on the earth fill and shall be mixed uniformly throughout the layer.

Compaction of fill shall be carried out to 95 per cent standard proctor if not otherwise indicated on the drawings.

In case of unsatisfactory compaction test results, the Contractor shall recompact or remove the fill to the satisfaction of the Engineer.

The number of tests to be made shall be agreed upon by the Engineer and the Contractor at commencement of the work.

The machinery the Contractor intends to use for compaction (pneumatic, vibrating, static or other rollers) must be approved by the Engineer before employment.

The Contractor shall take care that each separate layer is formed with side slopes to ensure that water cannot gather on the surface, thus causing softening of the soil. Compaction shall start from the side of the embankment and continue towards the middle.

On completion of the embankment to formation level and stipulated side slopes, the layer of topsoil mentioned in Clause 3.9 shall be applied.

Earth fill is measured after compaction.

3.9 Grass Planting and Top Soil.

Top soil shall be selected vegetable soil, well compacted and except where otherwise specified by of 150 mm thickness.

The Contractor shall trim the faces of the side slopes to open channels and elsewhere where directed to the dimensions, inclinations and curves shown on the Drawings, remove all excess material and make good all depressions with suitable material.

Where instructed by the Engineer, the Contractor shall plant Kikuyu or other approved grass at the rate of 16 plants per m2 corresponding to 250 mm c/c. The Engineer shall satisfy himself that natural growth of grass will not take place within a reasonable time before instructing the Contractor to grass specified areas.

The Contractor shall be responsible for obtaining suitable grass plants and for making all necessary arrangements with the owners and/or occupiers of the land from which they are to be obtained. The Contractor shall be responsible for the preparation of the embankment for planting, and for maintaining adequate grass cover and necessary watering during the Contract and Maintenance Period.

Top soiling and grassing are measured in square meters.

3.10 Ant-Proofing.

Where an ant-proof course has been specified, it should be made by application of Rentokil Termite Soil Concentrate or equal diluted one part concentrate to forty pars water (by weight) at the rate of 5 liters solution to 1 sq. meters to the whole area of the building immediately before (36 hours maximum) the concrete is poured. Additionally to all critical areas, i.e. both sides of wall foundations, piers and porches the application should be 5 liters per running meters. Treatment should not be made when the soil is excessively wet. Precautions should be taken to prevent disturbance of the treated areas before they are covered.

Ant-proofing is measured in square meters.

4.0 CONCRETE WORKS.

4.1 General.

All materials and workmanship for concrete shall comply with CP 110 and BS 5337 where applicable.

4.2 Materials and Tests.

4.2.1 Cement.

Cement shall be ordinary Portland cement complying with BS 12. The cement shall be delivered in properly sealed, unbroken bags.

Rapid hardening Portland cement complying with BS 12 may be used with the approval of the Engineer.

Quantities in excess of one ton shall be stored in a water-proof shed with a raised floor. The cement shall be used in the order in which it has been received.

Quantities of less than one tone for early use may be stored on a raised floor and covered by a water-proof tarpaulin.

Any cement damaged by water or proving defective shall be removed from the site immediately.

4.2.2 Aggregates for Concrete.

The aggregates shall comply in all respects with the requirements of BS 882.

The aggregates shall be free from dust, decomposed material, clay, earthy matter, foreign substances or friable, then or laminated material. The fine aggregate shall be of approved river sand.

Coarse and fine aggregates shall be stored on the sites in separate heaps so that no possibility of any intermixing of the two shall occur. Any materials, which have become intermixed, shall be removed by the Contractor forthwith.

A sample of all aggregates shall be delivered to the site for the approval of the Engineer, and it shall remain on the site until all concrete work is finished.

Should the Engineer so require, the Contractor shall furnish a certificate from an approved testing laboratory in connection with each source of fine and coarse aggregates showing that materials comply with the specification. All such testing shall be carried out at the Contractor's expense.

4.2.3 Water.

All water to be used for concrete, mortar and curing shall be of good drinkable quality, free from humus acid, chemicals, salts or other matters that in any way whatsoever, may be harmful to the concrete, either by diminishing the strength or causing a discoloration of the concrete.

Generally, water from Public mains shall be used, but if this is not possible, the contractor shall obtain water from other sources approved by the Engineer. The contractor shall by request provide test analysis according to BS 3148 from an approved laboratory.

4.2.4 Admixture.

Admixture of any kind of accelerating the setting of cement, plasticizers, water proffers, etc. shall not be used except by written permission of the Engineer. The Contractor must by request supply all details of any admixture.

4.2.5 Concrete Mixes.

Concrete shall be "Designed mixes" for reinforced concrete and "Nominal Mixes from Mass Concrete" used as shown on the drawings and in the Bills of Quantities. The concrete mixes, maximum aggregate sizes, maximum water/cement ratio and minimum cement content shall be in accordance with the following table.

Concrete Grade	Maximum size of Coarse Aggregate	Minimum Cement Content	Maximum water/cement Ratio
10	40 mm	210 kg/m^3	
15	40 mm	250 kg/m^3	
20	20 mm	320 kg/m^3	0.5
25	14 mm	390 kg/m^3	0.5

4.2.6 Trial Mixes.

The actual concrete mixes shall be determined prior to starting of concrete works according to CP 110.

For each grade of concrete three separate batches shall be made using the actual aggregates.

The workability of each of the trial batches should be determined and two times three cubes made from each batch for test at 7 days and 28 days.

The average strength of the nine cubes shall exceed the following values:

Concrete grade	Minimum average strength of 9 cubes At 7 days at 28 days	
20	21 N/mm^2	31.5 N/mm^2
25	24.5 N/mm^2	36.5 N/mm^2

For the trial mixes the mix proportions given in Table 50 in CP 110 shall be used.

4.2.7 Testing of Concrete.

Testing of concrete shall comply with CP 110.

All test cubes shall be manufactured, cured and tested as detailed in BS 1881.

The Contractor shall provide at his own expense all the necessary labour, equipment, moulds, transport, etc., required for manufacture of the test cubes. All test cubes requested by the Engineer shall be tested by Ministry of Works, Materials Branch, and the Contractor shall allow in his rates for concrete for all costs in relation with test cubes.

Should the Contractor require independent tests, he shall make them at his own expense, and the results of such tests shall not be valid unless test cubes are manufactured in the presence of the Engineer and tested by an approved agency and to the requirements in all details of the BS mentioned above.

Sufficient moulds and equipment shall be provided to enable a minimum of six test cubes to be prepared on each day when concrete is being mixed or such other number as the Engineer may direct. The Contractor shall be responsible for delivery of the test cubes to the Ministry of Works, material Branch, or other approved testing laboratory.

The precise location of the concrete, which the test cubes represent and the time of Placing, shall be noted on the drawings or elsewhere.

Where the concrete in the work is compacted by mechanical vibration, the test cubes shall be compacted by mechanical vibration, and where the concrete in the work is compacted by hand, the test cubes shall also be compacted by hand as specified in BS 1881.

The Engineer may in the Laboratory make test cubes for may purpose from site materials, and the Contractor shall supply such materials as required free of charge.

The test cubes shall be stored at the site of construction at a place free from vibration under damp sacks for 24 hours after which time they shall be removed from their moulds, marked and buried in damp sand or under water until the time for delivery to the testing laboratory.

The cubes shall then be stored in damp sand or other suitable damp material and sent to the testing laboratory, where they shall be similarly stored until the date of test. Test cubes shall be kept on the Site for as long as practicable but for at least three-fourths of the period before testing, except for tests at ages less than seven days.

4.2.8 Standards for Acceptance of Cube Tests.

The result of all cube tests shall be accepted by the Contractor and Engineer as true results of the crushing strength of the cubes. The cube strength shall be calculated from the maximum load sustained by the cube at failure.

The appropriate strength required may be considered to be satisfied if the requirements in CP 110 paragraph 6.5.1 are fulfilled.

CP 110 requires a considerable number of batches over a certain period. Until these requirements are fulfilled, the strength requirements as given in Clause 4.1.6 shall be adopted.

If the tests fail to give the required strength, further testing of the Concrete shall be carried out. If these tests fail to prove the strength of the concrete used, the Contractor shall at his own expense remove and replace all such concrete as directed by the Engineer.

4.2.9 Slump Tests.

Concrete consistency shall be determined by a slump test carried out in accordance with BS 1881 and at the Contractor's expense.

Unless otherwise specified by the Engineer, the following are the slumps for the particular class of work.

	Compaction by vibrator	Compaction by hand
Reinforced Concrete	30 to 60mm	
Mass Concrete	0 to 30mm	30 to 80mm

Concrete having a slump test value exceeding the values here-in specified may be rejected by the Engineer.

4.2.10 Steel Reinforcement.

Steel for reinforced concrete shall be stored under cover clear of the ground and shall comply with BS 4449, BS 4461 and BS 4483.

All steel reinforcement shall be supplied by an approved manufacturer, and the Contractor may be required to obtain a manufacturer's test certificate in respect of steel reinforcement supplied. In the absence of such a test certificate, the Contractor may be required to submit samples to be tested at the Contractors expense in such a manner as the Engineer may determine.

4.3 Precast Concrete Units

Precast concrete shall be cast in properly made strong moulds true to the shapes required. For work described "Finished Fair" the moulds shall be lined with hardboard, sheet metal or other approved material. The Concrete shall be thoroughly tamped in the moulds and shall not be removed from then until 7 days after placing the concrete, but the sides may be removed after 3 days, provided the moulds are such that the sides are easily removable without damaging the concrete.

The precast work shall be cast under sheds and shall remain under same for 7 days in the moulds and a further 7 days after removal from the moulds. During the whole of this period the concrete shall be shielded by sacking or other approved material kept wet. It shall then be removed from the sheds and stacked in the open for at least 7 days to season.

All precast work shall be cast in lengths convenient for handling unless otherwise described.

Prices are to include for handling reinforcement, hoisting and fixing and bedding in cement mortar, and for finishing exposed surfaces fair where described.

4.4 Workmanship

4.4.1 Inspection of Reinforcement and Formwork

No concreting shall commence until the reinforcement and formwork have been inspected and approved by the Engineer, Reinforcement in walls and columns shall be inspected and approved before being enclosed in the formwork. Before concreting any part of the Work, the Contractor shall give at least 24 hours notice in writing to the Engineer and obtain his approval.

4.4.2 Mixing of Concrete

Concrete for grade 20 and grade 25 shall be mixed by weight batching only, unless approval has been obtained from the Engineer for the concrete materials to be mixed by volume. Concrete for grade 10 and 15 can be mixed by volume.

The weight of coarse and fine aggregates in each batch shall be so computed that each batch contains one or more full 50 kg bags of cement.

All concrete is to be mechanically mixed in a batch mixer of an approved type. The dry materials for concrete shall be mixed in the mixer until a uniform colour is obtained after which the gauged quantity of water shall be gradually added. After all the water has been added, the mixer shall continue to mix for a period of not less than two minutes.

The mixers shall be equipped with an adjustable device capable of supplying a predetermined amount of water.

On the completion of each mixed batch of concrete, the mixer drum shall be completely emptied before a fresh batch is placed therein. On the cessation of work, the mixer ad all handling plant shall be washed out and shall always be left clean and free from hardened concrete. Any mix considered to be unsatisfactory by the Engineer for any reason, will be discharged to waste at the Contractor's expense, as and where directed by the Engineer, well clear of all mixed and placing operations in such a manner as to avoid the risk of defective concrete being incorporated in the Works.

The mixer shall be maintained in a first class condition throughout the Contract and any mixer or plant, which is faulty in any respect, shall not be used. The drums of all mixers shall revolve at the speed recommended by the makers. A mixer, which has been out of use for more than 20 minutes shall be thoroughly cleaned out before any fresh concrete is mixed.

The Contractor shall always have one spare mixer ready on the site to avoid interruption in the mixing and casting of concrete.

4.4.3 Transport and Placing of Concrete.

Concrete shall be transported in a manner which will avoid a segregation of the constituent material, and placing in the forms shall be completed before the concrete has taken its initial set. In no case shall concrete be place dint he Works more than 30 minutes after mixing. Concrete shall not be dropped through a height greater than 1.2 m. Chutes may be used if they are constantly kept free from

coatings of hardened concrete or other obstructions. Pumping of concrete through delivery pipes may be used, but only with the prior approval of the Engineer.

Concrete of any unit or section of the work shall be carried out in one continuous operation, and no interruption of the concreting will be allowed without the approval of the Engineer.

The concrete shall be placed in layers as directed by the Engineer over the whole area to be concreted and the second layer shall not be commenced until the first is completed. Sloping beds will not be allowed when placing concrete. Should any accidental segregation occur, the affected area shall be thoroughly turned over by hand until a homogeneous mix has been obtained.

When concreting walls and columns, the mix proportions of the first 250 mm depth of concrete placed in contact with the horizontal joint should be adjusted by reducing the amount of coarse aggregate.

4.4.4 Compaction

After the concrete has been placed in a position it shall be compacted by vibration with a rigid poker type with internal vibrator approved by the Engineer. The Concrete shall be worked well up against the form, joints and around the reinforcement and be free from voids and other imperfections. Under no circumstances shall the concrete be shifted or transported inside the form with vibrator.

The Contractor shall always have one spare vibrator ready on the site to avoid interruption in the mixing, casting and vibrating of concrete.

In the case of reinforced concrete, a competent steel fixer shall be in constant attendance during the placing of concrete to adjust and correct the position of the reinforcement, if so required, immediately before the concrete is placed. In no case shall the vibrators be attached to or be allowed to come into contact with the reinforcement.

4.4.5 Placing of Concrete under Water

Concrete shall only be placed under water with the prior approval of the Engineer who shall likewise approve the method to be used and the precautions necessary to prevent loss of material. In no circumstances shall concrete be dropped or place in water in a loose condition or be placed in flowing water. In all cases the cement

content shall be increased by 25 per cent for each class of concrete at the Contractor's Expense.

4.4.6 Placing of Concrete on Earth Surfaces

Earth surfaces on which concrete is to be placed shall be clean, firm and free from standing or flowing water. After the excavation has been completed to the approved lines, levels and dimensions it shall be kept as damp as practicable to reduce absorption of water from the concrete to a minimum. No concrete shall be placed until the prepared earth surface has been approved by the Engineer.

4.4.7 Construction and Expansion Joints

The position and arrangement of construction and expansion joints shall be as shown on the drawings. Where additional joints are requested, the positions must be approved by the Engineer.

All construction joints shall be rebated to form a key with subsequent work. Concreting of any unit or section of the work shall be carried out in one continuous operation up to construction joints and no interruption of the concreting will be allowed without approval.

Where shown on the drawings construction and expansion joints shall be provided with water bars of P.V.C. or other approved material. The widths and shapes of the water bars shall be as specified on the drawings and all joints shall be used. The trade mark of the water bars shall be approved by the Engineer before commencement of work, and fixing and jointing of water bars shall be approved by the Engineer before commencement of work, and fixing and jointing of water bars shall be approved by the Engineer before casting.

The fusing of water bars shall be performed in a way so as to secure that the two bars are joined over the entire width. The fused joint shall be able to withstand tension and shall be intact after 10 consecutive bendings. The Engineer may request that the fusing is carried out by specialists.

Where shown on the drawings, joints shall be provided with a joint sealing compound. The sealing compound shall be a two component polysulphide rubber sealing compound complying with BS 4254, and the trade mark shall be approved by the Engineer. The compound shall be placed in a chase made by a fillet strip in the formwork. The concrete shall be dry and a suitable primer shall be applied to the joint before applying the sealant. The procedure for the workmanship shall be approved by the Engineer before commencement of work, but the Contractor shall have the full responsibility for the water tightness of the joints. It should be noted that the lower part of the concrete walls shall be cast together with the floor slab and no joint directly on the slab will be permitted.

Before depositing fresh concrete against concrete which has already set, the face of the latter shall be roughened to expose the coarse aggregate, all cement latency removed whilst the concrete is still green and the surface thoroughly wetted with water and cleared of foreign matter. Cement mortar grout mixed in the proportion of one part of cement to two parts of sand shall be spread to a thickness of 5 mm over the face of the set concrete before the fresh concrete is deposited.

4.4.8 Curing and Protection of Concrete

Curing shall begin as soon as the surface of the concrete has hardened sufficiently. All exposed concrete surfaces shall be cured for a period of seven days by covering them with a layer of sand, hessian canvas or other approved material kept damp. Concrete shall be protected from sun, wind, heavy rains and flowing water for at least three days after placing.

4.4.9 Finishes of Horizontal Surfaces

Concrete surfaces for floors shall be true to level and falls as shown on the drawings. Water coming to the surface when vibrating shall be removed. After casting the surface shall be smoothened with a wooden flat. After some hours, when the surface has dried up, the surface shall be towelled smooth with a steel trowel.

All other horizontal surfaces shall have the same surface finish except for the final towelling with steel trowel.

4.4.10 Fishes of Vertical Surfaces

The shuttering for exposed concrete faces shall be so constructed that the latter shall be true to line and surface. The concrete shall be consolidated as specified against the shuttering to keep the face of the work free from honeycombing and other blemishes.

After removal of the shuttering, no concrete surfaces shall be treated in any way until they have been inspected by the Engineer.

If upon removal of the shuttering, the line or surface of the work is, in the opinion of the Engineer, unsightly and not in accordance with the requirements of the Contract, the Contractor shall at his own expense cut out and make good such portions of the work as the Engineer directs.

Rendering over defective surfaces shall not be permitted. Areas of honeycombing shall with the approval of the Engineer be made good immediately upon removal of the shuttering, and isolated superficial air and water holes shall be filled. Care shall be taken not to leave mortar or cement on parts f the surface which have been cast smooth and without pores.

Unless otherwise instructed, the face of exposed concrete placed against shuttering shall after removal of the shuttering be rubbed down with a carborundum stone or in other approved manner to remove fins and other irregularities, and washed perfectly clean.

Concealed concrete faces shall be left as from the shuttering, except that surfaces with honeycombing shall be made good.

4.4.11 Accuracy of Finish

The arrangement of all formwork shall be made in such a way that all dimensions shall comply as exactly as possible with those given on the drawings.

The following tolerances shall be respected:

Foundations	t	50 mm
Position of columns and Walls	t	5 mm
Thickness of walls	t	5 mm
Lateral dimensions of columns	t	5 mm
Level of slabs, beams	t	5 mm
Slab thickness	t	5 mm
Lateral dimension of beams	t	5 mm
Plumb of columns and walls	t	3 mm in each storey (non/accumulative)
Window and door opening sizes	t	5 mm

4.4.12 Construction of Formwork

All formwork shall be substantially and rigidly constructed of timber or steel or pre-cast concrete or other approved material and shall be true to the shape, line, level and dimensions shown on the Drawings.

Timber shall be well seasoned, free from loose knots and or Formwork of exposed concrete faces be planned to thickness. Faces in contact with concrete shall be free from adhering grout, projecting nails, splits, or other defects that will mark the concrete surface. Formwork for foundations and other concealed work may be undresses or rough timber.

All joints shall be sufficiently tight to prevent leakage of cement grout and to avoid the formation of fins or other blemishes, and all faulty joints shall be caulked. All formwork shall be thoroughly cleaned and coated with an approved type of oil before it is fixed in position. Immediately before concreting the formwork shall be watered thoroughly and washed out to remove sawdust, shavings or other rubbish. Where the appearance of the concrete face is important, the position and direction of the joints shall be as directed.

Fillet strips shall be fixed in the formwork to form a chamfer 20 mm by 20mm on all external corners of the concrete.

Openings for inspection of the inside of the formwork for walls, beams and similar work and for the escape of wash water shall be formed in such a way that they can be conveniently closed before starting to place the concrete.

Connections between formwork elements shall be constructed to allow for easy removal of the formwork, and shall be either nailed, screwed, bolted, clamped, braced or otherwise fixed securing a sufficient strength to retain the correct shape and line during compaction of the concrete.

Bracing members placed in the formwork to keep two sides of formwork in exact position shall be approved by the Engineer. Holes in the concrete after bracing arrangement shall be made good by plugging with approved material.

Top Formwork shall be provided to concrete faces where the slope exceeds 1 vertical to 2 1/2 horizontal. Such formwork shall be counterweighted or otherwise anchored against floating.

The formwork shall be so designed that the formwork for soffits of slabs and for sides of beams, columns and walls may be removed first leaving the formwork for the soffits of beams and their supports in position. Wedging or other suitable ways of adjustment shall be provided to allow accurate adjustments of the formwork and to allow a gradual removal of the same without jarring the concrete.

On demand the Contractor shall provide such drawings and calculations as necessary for determination of the structural strength of the formwork. The Engineer's approval of such drawings and calculations will not relieve the Contractor of his responsibilities under the Contract.

Formwork shall be erected true to line and braced and strutted to prevent deformation under the weight and pressure of the wet concrete, construction loads, wind pressure or other forces. Forming for beam soffits shall be erected with an upward camber as shown on the Drawings or as directed by the Engineer or of 2 mm for each 1 m of horizontal span.

Re-propping of beams will not be approved except when props are re-instated to relieve the beams of loads in excess of the design load. Vertical props shall be supported on folding wedges on sole-plates, or other measures shall be taken whereby the props can be gently lowered vertically when commencing to remove the formwork.

If, in the opinion of the Engineer, the formwork is faulty, inadequate or does not comply with the specifications, then the Contractor shall at his own cost modify the formwork until it meets the approval of the Engineer.

4.4.13 Mould Oil

All faces of formwork that will come in contact with wet concrete shall be treated with approved mould oil or other coating to prevent adherence to the concrete. Such coatings shall be insoluble in water, non-staining, nor injurious to the concrete, shall not become flaky and shall not be removable by rain or wash-water. Liquids that retard the setting of cement shall only be applied to the shuttering when approved. Mould oils and similar coatings shall be kept free from contact with the reinforcement.

4.4.14 Holes for Pipes, Cast-in Items etc., General

The Contractor shall be responsible for the co-ordination with the Sub-contractors for the setting out and fixing of all pipes and holes, pockets and chases for pipes. Sleeves provided by the sub-contractors are to be accurately set out and cast in and cutting away in completed concrete work is to be minimized.

Details of all holes etc. required in a structural work for services must be submitted to the Engineer who will assess the necessity for extra trimming reinforcement.

No openings, holes, chases, etc., are to be formed in the concrete without the approval of the Engineer and details of fixtures or fixings to be cast in must be approved.

4.4.15 Pipes through Water Retaining Walls

Pipes passing through water retaining walls and floors shall, wherever possible, be built into the structure in-situ. Shuttering shall be formed closely to the outside of the pipe, and concrete shall be placed and compacted thoroughly round the pipe.

Pipes, bolts or other steel items cast into the concrete in water retaining structures must not in any way be in contact with the steel reinforcement.

When not possible to build in place, pipes shall pass through preformed holes. Holes shall be formed with formwork which shall be stripped cleanly and without shock to the concrete. As soon as the shuttering is stripped, the hole shall be thoroughly wire brushed to expose the aggregate. The hole shall be as neat as possible to allow the pipe to be passed through the wall, while the corners shall be chamfered or rounded.

The pipe shall be set and the hole filled up as soon as possible. Immediately before filling, the hole shall be continuously soaked so as to saturate the concrete, and the surface coated with a stiff mix of 1:1 sand grout. Shutters shall be fixed true to the faces of the wall, and a stiff mix of concrete packed in until the hold is completely filled, particular care to be taken to ensure that the spaces beneath the invert of the pipe and beneath the slopping soffit of the hole are completely filled. Shuttering shall be stripped as soon as possible and the filling rubbed smooth. The filling and the surrounding concrete shall be kept wet for 7 days after filling.

4.4.16 Removal of Formwork

Formwork shall be left in position until the concrete has attained sufficient strength to be self-supporting. The Contractor shall be responsible for the safe removal of the formwork without shock or vibration - which would damage the concrete. Any work showing sign of damage through premature removal of formwork or through premature loading shall be entirely reconstructed at the Contractor's expense. The Engineer may delay the time of removal of formwork if necessary.

Subject to the above, the minimum period for removal of formwork shall generally be as follows:

Slabs	Soffits (props left under)	7 days
	Props	21 days
Beams	Sides	3 days
	Soffits	21 days
Walls and Columns	(unloaded)	3 days

When formwork is removed after 3 days, it will be necessary to ensure that the exposed surfaces of the concrete are kept thoroughly wet for the period of curing.

4.4.17 Reinforcement

All bending, cutting and fixing to comply with CP 110 and BS 4466. Normally Bending schedules are incorporated in the Contract Drawings, but the Contractor shall satisfy himself about their accuracy and about their complete coverage of the work involved. Any omission, inaccuracy or other errors observed by the Contractor shall be reported to the Engineer before commencement of the work.

In case of errors in Bending Schedules, no extra payment will be approved, provided the reinforcement is shown correctly on the Contract Drawings.

The number, size, shape and position of all the reinforcement shall, unless otherwise directed or permitted by the Engineer, be strictly in accordance with the drawings. Bars shall be of the shown lengths, and lapping, except where indicated on the Drawings, is not permitted unless approved by the Engineer.

Spacing between bars shall not differ more than 5 mm from the required spacing. Any inaccuracy in the total length of a bar as cut shall be compensated for in the end hooks or other approved parts of the bar.

The internal radius of a bend shall neither be less than allowed by BS 4466 nor less than the radius given in the Bending Schedule. The steel reinforcement shall be assembled and fixed in the form of a rigid case. To prevent displacement before or during concreting the bars shall be secured one to the other with approved binding wire at each intersection. In slabs and walls binding at every second intersection is sufficient.

Concrete cover blocks (mix 1:3) shall unless otherwise directed be used between the reinforcement, the bottoms and sides of the forms to ensure the specified concrete cover to the bars. Variations of cover shall be kept within plus/minus 3 mm from the specified cover.

The minimum clear horizontal distance between adjacent bars shall be of 25 mm or the diameter of the bar whichever is the biggest, and 25 mm vertically. Space bars shall be inserted at such intervals that the bars do not perceptibly sag.

Projecting bars shall be adequately protected against displacement both during and after concreting.

At the time of fixing and when concrete is being placed, all reinforcement shall be free from oil, painting, grease, dust and scale or any other coating which would destroy and bond with the concrete. The Contractor must obtain the Engineer's approval of the reinforcement when places, before any concreting is commenced.

5.0 BUILDERS WORK

5.1 Concrete Block Walling.

5.1.1 Precast Concrete Blocks

Concrete blocks shall comply with BS 2028. The blocks shall be type A, solid or hollow, as specified on drawings, with a minimum compressive strength of 3.5 N/mm2, tested as described in BS 2028.

All blocks must be left with good sharp edges. The standard face size of blocks for use in the works shall be 457 mm x 228 mm and this size of blocks shall be used wherever practicable.

No work with concrete blocks shall commence prior to a test report being presented to and accepted by the Engineer.

The contractor shall be responsible for making test blocks and experimenting with available materials to ascertain what mix will be necessary to attain the required strengths. If suitable materials are not available locally, the Contractor shall obtain them from other approved sources.

Manufacture shall be carried out under shelter and after casting, the blocks shall be stacked under shelter to protect them from sun and weather, and properly cured by covering with sand or sacks and sprayed daily for not less than 14 days.

5.1.2 Wall Reinforcement

Reinforcement in walls made of solid blocks shall, where so specified, consist of a 25 mm wide strip of "Exmet" or similar brick reinforcement centrally in joints at approximately 450 mm centres (vertically) for the full length of the walls, lapped and crimped 300 mm at running joints and full width of walls at angles and intersections.

5.1.3 Cement

The cement shall be as described in "Concrete Work".

5.1.4 Sand

The sand for mortars shall be as described in "Concrete work", except that it shall be fine sand.

5.1.5 Mortar

The cement mortar shall consist of one part of Portland cement to three parts of sand by volume.

The ingredients of mortar shall be measured in proper gauge boxes on a boarded platform, the ingredients being thoroughly mixed dry, and again whilst adding water. in the case of cement/lime mortar the sand and lime shall be mixed first, and then the cement added. All mortar is to be thoroughly mixed to a 5/2 uniform consistency with only sufficient water to obtain a plastic condition suitable for towelling. No mortar, that has commenced to seep, is to be used or remixed for use.

5.1.6 Damp-proof course

All damp-proof courses shall be of bituminous felt to BS 743 weighing not less than 3 Kg per m2, free from tears and holes, lapped 150 mm at running joints and for full width of wall at angles and intersections and bedded on an including a 12 mm levelled screed of cement mortar.

5.1.7 Workmanship

Blocks shall be laid in regular even courses and shall be bedded in cement mortar consisting of one part of cement to three parts of sand. Before being laid all blocks shall be immersed in water for at least 12 hours. All beds and vertical joints shall be filled completely with mortar when the blocks are laid, and no flushing up will be permitted. No vertical joint in any one course shall be within 100 mm of a similar joint in adjacent courses. Beds and joints shall be not less than 10 mm nor more than 15 mm thick. Blockwork Tanks excepted, see Clause 5.1.8).

The courses shall be laid parallel and all perpendiculars shall be truly kept. Reveals and internal and external angles shall be perfectly square and true.

All walls throughout the work shall be carried up evenly, no part being carried up more than 1 m higher than any other part.

The Contractor shall provide proper setting out rods and set out on the same all work showing openings, heights, sills and lintels and shall build the various walls and piers to the thicknesses, widths and heights shown upon the drawings.

All exposed faces of walls for plastering are to be left rough and the joints raked out while mortar is green to form adequate key.

All other faces shall be cleaned down on completion with a wire brush or as necessary and mortar droppings, smear marks, etc., removed and rates must include for this.

Where blockwork faces are to be left exposed, blocks shall be chosen for their uniformity, unmarked faces and unbroken arises and shall be finished with a fair face and pointed with a neat joint recessed from the face of the blocks.

Where shown on the Drawings, walls are to be carried up to the underside of the roof sheets and are to be cut on top edge to suit roof slope and flushed up in cement mortar.

All putlog holes shall not less than one course deep and carefully filled with a block cut to fit size of opening with beds and joints filled with mortar well tamped in after scaffolding is removed.

In the case of walls receiving plaster, or other insitu facings, putlog holes must be filled before any facing is applied and prices must include for additional cost of free-standing scaffolding. Tolerances as for concrete works (Clause 4.3.11).

5.1.8 Blockwork Tanks

The concrete blocks shall be solid, type A with a minimum compressive strength of 7 N/mm2, tested as described in BS 2028.

For circular blockwork tanks the blocks shall be manufactured in the required shape to fit the curvature of the tank, and all blocks shall be immersed in water for 24 hours before being laid.

Care must be taken to ensure that all joints are filled up completely. The horizontal joints to be reinforced as shown on the Drawings, with the reinforcement covered on all sides at least 6 mm of mortar, thus giving a thickness of horizontal joints of approximately 20 mm.

No parts of the wall shall be carried up more than one course above any other part of the wall.

Reinforcement and holes for pipes passing through walls and floors shall meet the requirements as specified in Section 4.

Internal plaster shall be of mix 1:2, made water proof by use of approved additive.

5.1.9 Measurement

Walls are measured in square metres for each thickness of walls.

The prices shall include for all straight cutting, bonding plumbing angles, forming reveals, pinning up to underside of concrete soffits and cutting up to sides of columns and cutting and pinning ends of lintels and sills.

5.2 Plasterwork and other Floor, Wall and Ceiling Finishings

5.2.1 Cement

The cement shall be as previously described in "Concrete works".

5.2.2 Sand

The sand shall be as described for fine aggregate, but that for plastering shall be light in colour and well graded to a suitable fineness in accordance with the nature of the work in order to obtain the finish directed.

5.2.3 Lime

The lime for plastering shall comply with BS 890 Clause "A" for non-hydraulic lime and shall be as rich as obtainable and to approval. It must be freshly burnt and shall be slaked at least one month before 5/4 being used by drenching with water, well broken up and mixed and the wet mixture shall be passed through a sieve of 3 mm meshes. Lime putty shall consist of freshly slaked lime as described above, saturated with water until semi-fluid and passed through a fine sieve; it shall than be allowed to stand until surplus water has evaporated and it has become of the consistency of thick paste, in no case for a shorter period than one month before being used, during which time it must be kept damp and clean and no portion of it allowed to become dry.

Alternatively, hydrated lime with 70% average calcium oxide content may be used and it must be protected from damp until required for use. It shall be soaked to a putty at least 24 hours before use.

5.2.4 Composition of plasters etc.

A mix referred as 1:4 shall mean 1 cubic metre of cement to 4 cubic metres of sand. All other mixes shall be construed in a like manner.

5.2.5 Hacking etc.

The prices for all screed, paving and plastering, etc. shall include for hacking concrete surfaces and for raking out joints of walls 15 mm deep and for cross scoring undercoats to form a proper key. Plastering on walls shall be generally be taken to include faces of lintels, beams, etc. in same.

5.2.6 Surfaces

All surfaces to be paved or plastered must be brushed clean and well wetted before each coat is applied. All cement pavings and plaster shall be kept continuously damp in the interval between application of coats and for seven days after the application of the final coat.

5.2.7 Partially or wholly set materials

Partially or wholly set material will not be allowed to be used or remixed. The plaster mixes etc. must be used within one hour of being combined with water.

5.2.8 Samples

The Contractor shall prepare sample areas of the screed, paving and plastering as directed until the quality, texture and finish required is obtained and approved by the Engineer, after which all work executed shall conform to the respective approved samples.

5.2.9 Finish generally

All screed and pavings shall be finished smooth, even and truly level unless otherwise specified.

Rendering and plastering shall be finished plumb, square, smooth and even.

All surfaces to be plastered shall be thoroughly wetted before any plastering is commenced. No plastering will be allowed to take place until all chases for services have been cut, services installed and chased made good.

On no account may finished plaster surface be chased and made good.

All work shall be to the approval of the Engineer and any work not complying with the above shall be hacked away and replaced at the Contractor's expense.

5.2.10 Arises and angles.

All arises and angles shall be clean and sharp or slightly rounded or thumb-coved as directed including neatly forming mitres.

5.2.11 Making good

All making good shall be cut out to a rectangular shape, the edges undercut to form dovetail key and finished flush with the face of surrounding paving or plaster. All cracks, blisters and other defects shall be cut out and made good and the whole of the works shall be perfect on completion.

5.2.12 Prices to include

In addition to the fore-going, prices are to include for all labour, angles and arises, all fair edges, for making good up to or stopping to a line and the required level at top of skirting or angles where directed and for making good up to windows, door frames and similar.

The prices for all linear items unless otherwise measured are to include for all short lengths, lengths, angles and arises, mitres and ends of every description.

5.2.13 Cement Pavings, Screed etc.

Cement screed shall consist of cement and sand mix 1:2 laid in panels and finished with a steel trowel if not otherwise specified.

Where specified as waterproof "Pudlo" or similar waterproofing compound shall be added to the cement paving or screed strictly in accordance with the Manufacturer's instructions.

Where practicable, screed are to be laid while the concrete is still green. When this is not practicable, the concrete is to be well washed and brushed perfectly clean with a steel wire brush, to remove a laitance and to give a roughened face as a key and then kept wet for at least seven days before the screed is laid. On the day of laying the surface is to be only damp with all surplus water removed and has to be painted with cement and sand mix 1:1 grout immediately before commencing laying of the screed. The grout is to be applied continuously in front of the screed, and not in large areas that will dry out before the screed is applied.

Screed shall be protected during the first stage of hardening from the harmful effects of sunshine, drying 5/6 winds, rain or water. In exposed positions, the screed shall be covered with a well wetted layer of sawdust, hessian or other approved material, and this layer shall be damp for at least seven days, during which period no traffic is to be allowed over the screed.

5.2.14 Cement rendering.

Cement rendering shall consist of cement and sand mix 1:4 to not less than 15 mm finished thickness and be finished to a true and even surface.

5.2.15 Protection.

All work shall be adequately protected against damage, to the satisfaction of the Engineer until the works are handed over to the Engineer.

5.3 Carpentry and Joinery

5.3.1 Timber Materials

All timber shall be in accordance with the latest approved Grading rules issued by the Government of Kenya (Legal Notice No. 358). The quality shall be as First (or Prime) Grade.

All timber work to be carried out in accordance with BS 1186 and CP 112.

Any of the following timber may be used:

Standard Common Name	Botanical Name
Podocarpus	Podocarpus Spp
Cedar	Juniperus Procera
African mahogany (Munyama)	Khaya anthotheca
Mininga	Pterocarpus Angloensis
Mvule	Chrophora Excelsa

All timber, as it arrives on the Site, shall be inspected by the Engineer, and any timber brought on the Site and not complying with the Specification or not approved, must be removed forthwith from the Site, and only timber as approved shall be used in the works.

The Contractor shall upon signing the Contract, purchase sufficient supplies of specified hardwoods to avoid possible shortages at a later date.

All timber shall be free of live borer beetle or other insect attack when bought upon the Site. The Contractor shall be responsible up to the end of the maintenance period for executing at his own cost all work necessary to eradicate insect attack of timber, which becomes evident - including the replacement of timber attacked or suspected of being attacked, notwithstanding that the timber concerned may have already been inspected and passed as fit for use. All timber shall be seasoned to a moisture content of not more than 15%.

5.3.2 Boards and Sheets

Fibreboard shall be 12 mm "Celotex" or other approved fibreboard complying with BS 1142, Part 3,

Plywood shall be laminated board faced on in both sides with 4 mm plywood. Exposed edges shall be lipped with 20 mm hardwood and rates shall include for leaping.

Plastic Sheeting shall be "Formica" sheeting, 1.5 mm thick and securely fixed with approved type waterproof adhesive, and in the colours approved by the Engineer.

Flush doors shall be 45 mm thick, and shall be obtained from an approved manufacturer. The doors shall comply with BS 459, Part 2. External doors shall be framed, ledged and braced as shown on the drawings, and they shall comply with BS 459, Part 4.

5.3.3 Workmanship

All timber shall be as long as possible and practicable to eliminate joints. Where joints are unavoidable, surfaces shall be in contact over the whole area of the joint before fastenings are applied.

No nails, screws or bolts are to be fixed in any split end. If splitting is likely, or is encountered in the course of the work, holes for nails must be bent at right angles to the grain.

Lead holes are to be bored for all screws. When the use of bolts is specified, the holes are to be bored from both sides of the timber. Nuts must be brought up tight, but care is to be taken to avoid crushing of the timber under the washers.

All joiners' work shall be accurately set out on boards to full size for the information and guidance of the artisans before commencing the respective works, with all joints, ironwork and other works connected therewith fully delineated. Such setting out must be shown to the Engineer and approved before such respective works are commenced.

All joiner's work shall be cut out and framed together as soon after the commencement of the building as is placable, but not to be wedged up or glued until the building is ready for fixing same. Any portions that wraps, wind or develop shakes or other defects within twelve months after completion of the Works shall be removed and new ones fixed in their place together with all other work which may be affected thereby, all at the Contractor's own expense.

All work shall be properly mortised, tenoned, housed, shouldered, dovetailed, notched, pinned, bradded, etc., as directed and to the satisfaction of the Engineer and all properly glued up with the best quality glue.

Joints in joinery must be as specified or detailed, and so designed and secured as to resist or compensate for any stresses to which they may be subjected. All nails, springs, etc., are to be punched and puttied. Loose joints are to be made where provision must be made for shrinkage, glued joints where shrinkage need not be considered and where sealed joints are required. Glue for load bearing joints or where conditions may be damp must be of the resin type. For non-load bearing joints, or where dry conditions may be guaranteed, casein or organic glues may be used.

All exposed surfaces of joinery work shall be wrought and all arises "eased off" by planning and sandpapering to an approved finish suitable to the specified treatment.

Round wood plugs shall not be used. All work described as plugged shall be fixed with screws to plugs formed by drilling concrete, walls, etc., with a proper tool of suitable size and filling the holes completely with "Expandet" raw plastic or "Rawlplugs" in accordance with the Manufacturer's instructions.

Where intended to be in contact with stone, concrete blocks, cement or plaster, the backs and other faces of all doors, windows and other

frames and linings, posts, architectural skirting, fillets and fascias shall be treated with two coats of wood preservative before fixing.

Bottom edges of doors shall be painted with one coat of approved primer before fixing.

Any fixed joinery which in the opinion of the Engineer is liable to become bruised or damaged in any way shall be completely cased and protected by the Contractor until the completion of the Works.

5.3.4 Inspection and Testing

The Engineer shall be given facilities for inspection of all works in progress whether in workshop or on Site. The Contractor is to allow for testing of prototypes of special construction units and the Engineer shall be at liberty to select any samples he may require for the purpose of testing, i.e. for moisture content, identification, species, strength, etc. Such tests will be carried out by the Forestry Department.

5.3.5 Clearing Up

The Contractor is to clear out and destroy or remove all cut ends, shavings and other wood waste from all parts of the building and the site as the work progresses and at the conclusion of the work.

This is to prevent accidental borer infestation and to discourage termites and decay.

5.3.6 Prices to Include

Prices of items shall include for the foregoing labours, etc. and in addition the prices for linear items are to include all internal and external angles, either mitres or tongued, all fair, fitted, stopped, notched or returned ends, all similar incidental labours and all short lengths.

The Contractors rates must also include for bedding frames, sills, etc., in mortar or dressing surfaces of walls etc.

5.4 Roofing

5.4.1 Asbestos Roof Sheeting

The floor sheeting and fittings shall be "Super-Seven" corrugated asbestos cement roofing, manufactured by the Kenya Asbestos Cement Co. Ltd. laid and fixed in strict accordance with the manufacturer's instructions.

Fixing to be of approved type and quality.

5.4.2 Protection

All roof surfaces shall be kept clean and protected and handed over watertight at completion.

5.5 Steelwork

5.5.1 Materials

All materials shall b the best of their respective kinds and free from defects. The materials in all stages of transportation handling and stacking shall be kept clean and injury from breaking, bending \and distortion prevented.

All steel and steel sections shall comply with BS 4, BS 4360 and BS4848.

All steel shall be of approved manufacture and the Contractor shall on request deliver to the Engineer a manufacturers test certificate for all steel used.

All structural steel shall be of grade 43A according to BS 4360. Steel for handrails, screens etc. can be of a lower grade, but all steel shall be weldable and the grade shall be approved by the Engineer.

Electrodes shall be according to BS 639.

All electrodes shall be of a class appropriate to the steel. Bolts and nuts shall be according to BS 4190.

5.5.2 Workmanship

Workmanship for all steelwork shall generally follow the requirements in BS 449 and BS 5135.

The Contractor shall prepare all the necessary workshop drawings, which shall be approved by the Engineer. The Engineer's approval shall not in any way relieve the Contractor of his responsibility for the Workshop drawings being in accordance with the contract drawings and specifications.

All welding of structural steel shall be carried out in the Contractor's workshop and the whole structure or pars thereof shall be test assembled in the workshop before delivery to the site.

Should any doubt arise as to the quality of the steel or the welds, the Engineer may require testing carried out. If the results show insufficient quality of materials or workmanship, the Contractor shall cover all expenses related to the tests and shall replace and rectify all materials and welds found unsatisfactory.

5.5.3 Ladders

All ladders in tanks etc. shall be galvanized steel pipes in accordance with BS 1387 "medium class", and shall be made to the dimensions shown on the drawings.

5.5.4 Measurements

The rates inserted in the Bills of Quantities shall include for preparing workshop drawings, cutting to specified lengths and shapes, drilling of holes, welding, bolts, nuts washers, gusset plates, base plates etc.

5.6 Ironmongery and other Fittings

All ironmongery shall be approved by the Engineer. The approve samples shall be regarded as the standard for work.

5.6.1 Locks

All locks and ironmongery shall be with screws, etc. to match. Before the door etc. is painted, handles shall be removed, carefully stored and refixed after completion of painting. Locks shall be oiled and left in perfect working order.

25 mm diameter rubber door stops shall be provided at all doors and securely plugged and screwed to floors or walls.

All external doors shall be provided with locks of cylinder type. All internal doors to be provided with approved latch locks and handles. All locks shall have two keys with attached labels with door references before being handed over to the Engineer.

5.6.2 Sanitary Fittings

All sanitary fittings shall be approved manufacture and installed in accordance with the manufacturer's recommendations.

5.7 Glazing

5.7.1 Glass

All glass shall comply with BS 952 and be free from flaws, bubbles, specks and other imperfections.

Glass panes shall be cut to sizes to fit the opening with not more than 2 mm play all round and where puttied shall be clipped to the frames.

Clear sheet glass shall be ordinary glazing quality.

5.7.2 Cleaning Etc.

On completion, remove all broken, scratched or cracked panes and replace with new to the satisfaction of the Engineer. Clean inside and out with approved liquid cleaner. On no account shall windows be cleaned by scraping with glass.

5.8 Painting, Decorating and other Surface Treatment

5.8.1 Approved Specialist

All work under this trade must be executed by an approved specialist unless the Engineer agrees otherwise.

All paint shall be of approved manufacture.

5.8.2 General

The Contractor shall so arrange his programme of work that all other trades are completed and the workmen are away from the area to be painted, when painting begins. Before painting, the Contractor must remove all concrete and mortar dropping and the like from all work to be decorated and remove all stains as to obtain uniform colour to work to be oiled and polished.

All plaster, metal, wood and other surfaces which are to receive finishes of paint, stain, distemper or paintwork of any description are to be carefully inspected by the Contractor before he allows any of his painters to commence work. The Contractor will be held solely responsible for all defective work condemned as a result of his painter's failure to insist on receiving from the other trades surfaces in the proper condition to allow first class finishes of the various kinds specified being applied to them.

5.8.3 Painting generally

All materials to be applied externally shall be of exterior quality and/or recommended by the manufacturers for external use, all in accordance with CP 231.

All materials shall be delivered on site intact in the original sealed drums of tins and shall be mixed and applied strictly in accordance with the manufacturer's instruction and to the approval of the Engineer.

Unless specially instructed or approved by the Engineer, no paints are to be thinned or otherwise adulterated, but are to be used as supplied by the manufacturers and direct from the tins.

The priming, undercoats and finishing coats shall each be of differing tints and the priming and undercoats shall be the correct brands and tints to suit the respective finishing coats in accordance with the manufacturer's instruction. All finishing coats shall be of colours and tints selected by the Engineer. Each coat must be approved by the Engineer before the next coat is applied.

All paints, emulsion paints and distempers shall be applied by means of a brush or spray gun or rollers of an approved type where so

agreed by the Engineer.

No painting is to be done in wet weather or on surfaces which are not thoroughly dry.

Each coat shall be properly dry and in the case of oil or enamel paints shall be well rubbed down with fine glass paper before the next coat is applied. The paintwork shall be finished smooth and free from brush marks.

The rates for painting shall include for preparation of surfaces, rubbing down between each coat, stopping, knotting, etc. and all other work in connection and as described and as necessary to obtain a first class and proper finish to the Engineer's approval.

5.8.4 Samples

The Contractor shall furnish at the earliest possible opportunity before work commences and at his own cost, samples of painting for the Engineer's approval and any further samples in the case of rejection. Such samples when approved, shall be the minimum standard for the work to which they apply.

If required by the Engineer, the Contractor is to provide at his own expense samples of paints, etc., with containers and cases to be forwarded carriage paid by the Contractor for analysis at a laboratory.

Colour cards of all paints, etc. shall be submitted to the Engineer. The Engineer may reject any materials or workmanship not in his opinion up to the approved sample, and these must be removed from the site without delay.

5.8.5 Preparation and Priming of Plaster etc. Surfaces

Surfaces shall be perfectly smooth, free from defects and ready for decoration. All such surfaces shall be allowed to dry for a minimum period of six weeks, stopped with approved plaster compound stopping and rubbed down flush, as necessary, and then be thoroughly brushed down and left free from all efflorescence, dirt and dust immediately prior to decorating.

Plaster surfaces, which are to be finished with emulsion, oil or enamel paint, shall be primed with an alkali resisting primer complying with the particular paint Manufacturer's specification and applied in accordance with their instructions.

Fibreboard or similar surfaces shall be lightly brushed down to remove all dirt, dust and loose particles and have all nail holes or other defects stopped with an approved plaster compound stopping rubbed down flush and left with a texture to match surrounding material.

5.8.6 Preparation and Priming of Metalwork

All surfaces shall be thoroughly brushed down with wire brushes and scraped were necessary to remove all scale, rust, etc. immediately prior to decorating. Where severe rust exists and if approved by the Engineer, a Proprietary de-rusting solution may be used in accordance with the manufacturer's instructions.

Shop primed and unprimed surfaces shall be given one coat of metal chromate primer or lead oxide primer.

Galvanized surfaces shall be treated before priming with an approved proprietary mordant or de-greasing solution. The surfaces shall be thoroughly washed down with water, allowed to dry and primed as last.

Coated surfaces already treated with bituminous solution, shall be scraped to remove soft parts and then receive two isolating coats of aluminium primer or other approved anti-tar primer.

5.8.7 Preparation and Priming Woodwork.

All woodwork shall be rubbed down, all knots, covered with a thick coat of good shellac or aluminium knotting; primed with one coat of approved ready-mixed proprietary wood primer and all cracks, nail holes, defects and uneven surfaces, etc., stopped and faced up with hard stopping rubbed down flush.

5.8.8 Wood preservative

All woodwork in contact with walling or plaster shall be treated after cutting and preparation but before assembly or fixing with one coat of approved wood preservative. The solution is to be brushed on all faces of all timbers, unless exposed to view and painted.

5.8.9 Cement Paint

Shall be Super Snowcem or equal and approved. Two coats shall be applied after preparation as specified above.

5.8.10 Emulsion Paint

After preparation as specified above a minimum of three coats shall be applied using a thinning medium or water only if and recommended by the Manufacturer.

An approved plaster primer tinted to match may be substituted for the first coat.

5.8.11 Enamel Paint

Apply two undercoats and one finishing coat, after preparation and priming as specified above.

5.8.12 Ironmongery

Where instructed, all ironmongery shall be removed from joinery, steel windows and louvres before panting is commenced, and shall be cleaned and renovated if necessary and refixed after completion of painting.

5.8.13 Painting Items

As billed here-after shall include for preparing and priming surfaces as above described.

5.8.14 Lining of Chemical Tanks

The lining of chemical tanks with "EPOBOND" and "EPOFLOOR" shall be carried out by specialists approved for such work by the manufacturer or his agent.

The preparation of the surface to receive the above products must either be carried out by specialist or by the Contractor in which case the manufacturers or his agents written approval of the preparation of the surface shall b obtained prior to the application of the product.

5.8.15 Cover Up

Cover all floors, fittings, etc. with dust sheets when executing all painting and decorating work.

5.8.16 Clean and Touch Up

Paint splashes, spots and stains shall be removed from floors, wood-work, etc., any damaged surfaces touched up and the whole o the work left clean and perfect upon completion and during the maintenance period.

6.0 PIPEWORKS

6.1 Materials, General

All pipes, couplings, gaskets, lubricants, seals, coupling machineries etc., necessary for the proper construction of the pipe works as detailed in the Bills of Quantities and drawings shall be supplied by the Contractor.

The Contractor shall be responsible for ensuring that the pipes, couplings and other fittings laid o installed on each section of the work is of the standard and pressure classification specified as appropriate to the circumstances, and are manufactured of the specified materials.

The Engineer reserves his right to refuse any materials that in his opinion is inferior.

The Engineer has the right to test any material upon delivery, and materials found defective shall be replaced forthwith by the Contractor.

If the Contractor procures materials of different specifications in respect of flanges and threads etc. (Imperial units-metric units), he shall at his own cost provide all adaptors and other fittings necessary to make connections to the satisfaction of the Engineer.

All materials shall be marked as specified in the relevant current British or ISO Standards for easy identification on site.

6.2 Handling and Storing Materials, General

The method of transportation, handling and storing of pipes and fittings shall be in accordance with the manufacturer's recommendations.

Pipes, valves, specials and other materials shall be handled, moved, lifted or lowered with the least possible impact. Handling equipment shall be of approved type. In slinging pipes only flat slings shall be used and the use of chain slings, hooks or other devices working on scissors or grab principles shall not be permitted. Pipes shall be slung from two or more points as the Engineer may direct and the Slinging, lifting and lowering shall be in the hands of a competent and experienced man.

Subject to the requirements of inspection before acceptance, protective bolsters, caps or discs on the ends of flanges of pipes or specials shall not be removed until the pipes or specials are about to be lowered into the trench. Every precaution shall be taken to prevent damage to internal linings or external coatings.

Pipes in storage shall be supported clear of the ground on approved supports and adequately braced to prevent rolling. They shall not be stacked more than four tiers high without the approval of the Engineer.

Materials of different classification shall be stored separately.

All pipes and associated material shall at all times be protected from sun and weather to the satisfaction of the Engineer.

No valves shall be lifted by the spindle.

No valves, fittings or specials shall be stacked more than one tier high without the permission of the Engineer, and they shall not be stored in a dirty place or condition and shall not be allowed to become embedded in earth, sand, stone, aggregate, water, fuel, or any other deleterious matter.

Valves and their ancillary equipment shall be protected before and after erection against collapse of earthworks, falls of materials, concrete and cement droppings, wood and other matter.

Shortly before the laying or fixing any valve, pipe or fitting the Contractor shall in the presence of the Engineer or his representative carefully examine each valve, pipe and fitting to ascertain damage or defect occasioned to the valves, pipes and fittings during loading, unloading, handling, storage and transportation. All damage and all defects revealed by this examination shall be repaired and remedied by the Contractor.

6.3 Laying and Jointing, General

6.3.1 Pipes and Fittings

All laying and jointing of pipes except jointing of PVC and polythene pipes shall be in conformity with CP 310 and CP 2010.

The bottom of the trench or surface of the bed shall be finished to a smooth even surface at the correct level to permit the barrel of the pipe to rest on the surface throughout its whole length between joint and sling holes. If considered necessary by the Engineer, fine screened material shall be placed and consolidated in the trench bottom to provide such a bed.

In General, the preparation of the trench bottom and bed shall be completed for a length of one pipe in advance of the pipe-laying. The bottom of the trench and pipe bed shall be inspected by the Engineer, and only when passed as satisfactory shall pipe laying commence.

Each pipe shall be laid accurately to line, level and gradient so that, except where otherwise directed, the finished pipe line shall be in a straight line both in horizontal and vertical plans.

The levels and gradients shown on the Drawings shall be rigidly adhered to unless otherwise ordered by the Engineer.

Where lines of pipes are to be constructed, the Contractor shall provide and fix, at such points as may be directed, properly painted and securely positioned sight rails, the levels and positions of which shall be examined and checked by the Engineer before the rails are used and as often thereafter as may be necessary. There shall at no time be less than three sight rails in position on each length of pipeline under construction to any one gradient, and the sight rails shall be situated vertically above the line of pipes, or immediately adjacent there-to.

Pipes shall be lowered singly into the trench, brought to the correct alignment and inclination bedded throughout their length, and properly jointed strictly in accordance with the manufacturer's instructions.

Notwithstanding any flexibility provided in pipe joints, pipes must be securely positioned to prevent movement during and after the making of a joint. On screw and socket joints threads shall be coated with an approved tape to ensure water tightness.

Long radius curves in the pipeline shall be negotiated by deflections taken up in the joints or pipes of one or more lengths of pipes. The deflection at each of the various types of joint of pipes used in the Works shall not exceed the manufacturer's specifications.

The Contractor shall take care that all pipes and couplings are clean and free of foreign matter before subsequent sections are jointed.

The Contractor shall obtain from the manufacturer or other approved supplier the necessary tackle required for the proper jointing of the pipes.

The Contractor shall make himself and his employees acquainted with and comply with the instructions issued by the manufacturers of the various types of proprietary joints and couplings for incorporation in the Works. The Contractor shall be responsible for obtaining copies of such instructions.

No person shall be employed on the jointing of pipes who is not thoroughly experienced and skilled in the particular work in hand. Pipes shall not be cut without the permission of the Engineer.

The cut shall be made with an approved mechanical pipe cutter and the edges of the cut shall be clean, true and square. Threading of steel pipes shall be done with an approved device.

The normal continuity of construction may have to be interrupted at points on the pipelines pending the delivery of certain valves or specials. The exact extent of the temporary gap to be left in such instances shall be predetermined, but shall not be fixed without reference to the Engineer to when the Contractor shall submit for approval a sketch with dimensions showing details of the pipe and jointing arrangement to be adopted to effect ultimate closure.

Special care shall be exercised to preserve the accurate alignment of the pipeline over the extent of the temporary gaps which may be necessary to leave.

Subject to the permission of the Engineer, pipes shall be covered over with approved fill material upon successful completion of laying and joining. Joints shall be left exposed until completion of the pressure test.

Fill for surrounding and cushioning shall consist of uniformly readily compatible material free from tree roots, vegetable matter, building rubbish and excluding clay lumps retained on a 75 mm sieve and stone retained on a 25 mm sieve.

The materials for bedding shall, where ordered consist of suitable selected materials obtained from the excavations or from approved borrow pits and transported to the location where they are required.

Adequate precautions shall be taken by way of back-filling or other means to anchor each pipe securely to prevent flotation of the pipeline in the event of the trench being flooded or during concreting.

Upon successful completion of the pressure test, the pipeline shall be back-filled as specified.

Supplying of pipes is measured on linear metres.

Storing, handling, laying and jointing of pipes is measured in linear metres. The rates shall include for levelling of the trench bottom, compacting the foundation, embedding he pipe together with the materials used for the bedding, testing, cleansing and sterilizing all to the satisfaction of the Engineer.

6.3.2 Valves and Specials

Unless otherwise directed, all valves, flow meters, fittings and specials shall be individually supported and their weight shall not be borne by the pipeline, joints or couplings etc.

All supports for valves and fittings shall be of concrete Grade 20 or as specified on the drawings.

Where air valves are to be placed, the Contractor shall ensure that the highest point in the main is determined by levelling instrument.

Air valves shall be checked before the main is charged to ensure that the balls and faces are not scored or split, and that there is no dirt or other deleterious materials into the cavities of the body. All air nozzles shall be probed to see that they are clear. No air valve shall be stored before erection in the open in sunlight, or upside down to expose the balls and air cavities.

Scour valves shall be installed at low points in the pipelines as shown on the Drawings. The Contractor shall be in agreement with the Engineer on the exact position of scour valves in particular situations.

Scour valves shall, where possible, discharge into the direction of natural drainage and at such a distance from the Works as to preclude erosion effects.

Unless otherwise directed, the controlling valve for a scour shall be installed not more than 1.5 m from the main pipeline.

Valve penstocks and other fittings shall be securely fixed and where require extension spindles and headstocks shall be properly aligned and fixed in a vertical position unless otherwise directed. They shall be tested for ease of operation and water tightness and valve glands shall be repacked where necessary. Any damaged protective coating shall be made good and they shall be left clean in all respects.

Before each valve is put into service all gears, bearings and spindles shall be oiled with an approved oil as recommended by the valve manufacturer. Oil baths shall be topped up to the appropriate levels and all grease nipped charged with grease of approved manufacturer. No deleterious matter shall be allowed to come into contact with the working faces and oil sumps shall be maintained clean.

All valves, fittings, specials shall be fixed with proper sealing tape, gaskets, washers etc. as necessary to the satisfaction of the Engineer.

The rates in the Bills of Quantities shall cover for the supply storing handling, installation and joining, together with all bolts, washers, gaskets and lubricants etc.

6.4 Pipes and Fittings

6.4.1 Flanges

Where flanged joints are used, flanges shall be in accordance with the requirements of BS 4504: Part 1 or BS 4622 or BS 4772.

The minimum pressure rating shall be for a working pressure of 1.6 N/mm2 (approximately 160 metres head) corresponding to NP 16 flanges.

The hydraulic test pressure shall not exceeds 2.5 N/mm2.

The number of holes shall be as follows:

Ø80 mm to Ø150 mm - 8 holes

Ø200 mm to Ø300 mm - 12 holes

Ø350 mm to Ø400 mm - 16 holes

Ø450 mm to Ø600 mm - 20 holes

Flanges in pipelines with higher pressure rating shall be for a working pressure of 2.5 N/mm2 (approximately 250 metres head) corresponding to NP 25 flanges. The hydraulic test pressure shall not exceed 4.0 N/mm2.

Bolts, nuts and washers shall comply with the requirements of BS 4190 and BS 4320. Gaskets shall fulfil the requirements of BS 2494 and shall have a minimum thickness of 2 mm.

6.4.2 Ductile Iron

Ductile iron pipes and fittings shall comply with BS 4772 or ISO 2531, and pipeline contribution shall be as per CP 2010 Part 3. The pressure rating of the pipes shall be for a minimum working pressure of 2.5 N/mm2. Care should be taken when the pressure test is carried out not to exceed the permissible test pressure for the fittings installed.

Joint shall be either "Tyton", "Stanlock", "Viking Johnson" of flanged joints as specified in the drawings and the Bills of Quantities. Before any other joint is used, written approval of the Engineer must be obtained. Pipes and fittings shall be coated inside the outside with a hot material complying with the requirements of BS 4147, type 1, grade "d", or with a cold applied material complying with BS 3416: Type II material.

6.4.3 Grey Iron or Cast Iron

Grey iron or cast iron pipes and fittings shall comply with BS 4622 or ISO/R 13. The pressure rating of the pipes shall be for a minimum working pressure of 1.0 N/mm2 (approximately 100 metres head) and a hydraulic test pressure of 1.6 N/mm2.

6.4.4 Steel Pipes

The steel pipe shall conform to B.S. 534 1981, B.S. 1387, B.S. 3600 and B.S. 3601 and pipeline contribution shall be as per CP 2010 part 2,1970 and unless otherwise stated specials shall be made from pipes that have been manufactured and tested in accordance with B.S. 3601. Joints shall be screwed and shocked for nominal diameters upto 50mm and flanged or socketed for nominal diameter above 50mm unless otherwise wise stated.

The type and flanged or socketed for nominal diameter above 50 mm unless otherwise stated. The type of joint used shall be to the approval of the Engineer. The pipes and specials shall be protected from corrosion internally and externally complying with the requirements of BS 539. The type of protection used shall be to the approval of the Engineer.

Welds shall be inspected by Radio graphical Non Destructive. Testing and Tensile and Weld Bend tests as per American petroleum Institute Specification 5 LS.

Steel Tubes and tubular with screwed and socket joints shall be covered by the requirements of BS 1387. Flanges shall be as specified in Clause 6.4.1 and threads as specified in BS 21.

6.4.5 Unplasticized Polyvinyl Chloride Pipes

All PVC pipes and fittings shall comply with KS 06-149:1981, ISO 161/1-1976 (E) or BS 3505.

Pipes indicated with a pressure class shall conform to the following minimum working pressures.

Class 0.6 MPa - 0.6 N/mm2 (marking: red) (KS classification: A)

Class 0.9 MPa - 0.9 N/mm2 (marking: blue) (KS classification: B)

Class 1.2 MPa - 1.2 N/mm2 (marking: green) (KS classification: C)

Class 1.5 MPa - 1.5 N/mm2 (marking: brown) (KS classification: D)

All fittings shall be of pressure class 1.5 MPa and be manufactured of cast iron, PVC or steel.

Joints to be solvent Cement Joints for nominal sizes equal to or smaller than Ø50 mm and mechanical joints (rubber ring) for nominal sizes equal to or bigger than Ø80 mm.

For both types of joints the manufacturer's jointing instructions must be strictly adhered to.

For solvent cement joints, it is essential that the solvent cement used is the correct type, i.e. it shall be purchased from the same factory which delivers the pipes.

The rubber ring joints can be either the Polva type, which incorporates only one rubber ring or loose couplers with two rubber rings. In any case, the fittings used shall be purchased from the safe factory which delivers the pipes.

If the joint is difficult to push home, the manufacturer should be consulted immediately. No cutting or scrapping in any of the joints components shall take place, and all pipes shall be jointed manually. PVC pipes and fittings shall be stored under cover, which fully protects the material from sunlight.

6.4.6 Polythene

Polythene (Palothene) pipes shall comply with BS 3284.

Couplings and other fittings to be of the Compression type or the Singer type. The material for both types of fittings to be brass In any case, the fittings used shall be purchased from the same factory, which delivers the pipes.

For both types of joints the manufacturer's jointing instructions must be strictly adhered to. The pipe classes and markings shall correspond to those of PVC pipes.

6.4.7 Precast Concrete

Precast concrete pipes and fittings shall comply with BS 556: Part 2.

Minimum crushing test loads shall be as specified in Table 2, Standard pipes.

The laying and jointing of the pipes shall comply with CP 301.

The Contractor shall adopt such measures as may be approved by the Engineer to ensure that every newly laid pipe is concentric with previously laid pipes with which it joins.

Unless otherwise approved by the Engineer pipes shall be laid in an upstream direction and the socket ends shall point upstream.

Before commencing the laying operation, the Contractor shall ensure that the parts of pipe which will come into contact with the jointing

material are perfectly clean. Cement mortar joints for spigot and socket pipes shall be made as

follows:

(1) Before commencing the jointing operation, the socket of the previously placed pipe and the spigot of the new pipe shall be cleaned and thoroughly soaked with water.

(2) The spigot shall be wrapped one complete lap with tarred hempen spun yarn and the new pipe shall be carefully drawn towards the previously laid pipe so that spigot enters the full depth into the socket of the previously laid pipe. The new pipe shall then be adjusted and fixed in its correct position in line, level and gradient and the tarred yarn shall be caulked tightly home into the socket. On completion of this operation, the yarn shall not fill more than one quarter of the total depth of the socket.

(3) The remainder of the socket shall be completely filled with cement mortar consisting of one part of cement to three parts of sand. The mortar filling shall terminate flush with the socket and shall be nearly towelled to a smooth finish around the pipe.

(4) To assist the curing of the mortar, the Contractor shall cover the joints immediately after they are made with a layer of hessian, which shall be kept, continuously wet during daylight hours and he shall further adopt such other measurers as the Engineer may direct.

Provided the Contractor has the Engineer's written consent other means of jointing may be adopted, e.g. rubber ring-joints. The Engineer's instructions in regard to other jointing materials must be strictly complied with.

6.5 Protection of Pipes

The concrete used for bedding, hunching and surrounding the pipes shall be concrete "Grade 15" unless otherwise ordered by the Engineer. The concrete protection shall have total dimensions not less than those given below.

The various types of concrete protection to pipelines are detailed below:

(1) Bedding concrete shall have a width of at least 300 mm bigger than the external diameter of the pipe and shall support at least the bottom quarter of the pipe circumference. it shall have a minimum depth of 100 mm measured under the pipe throughout the cross-section.

(2) Bedding and hunching shall comprise a concrete bed with a minimum width of 300 mm more than the external diameter of the pipe and a minimum thickness of 150 mm below the pipe, and hunching with a minimum thickness of 150 mm on both sides of the pipe. The top of the hunching to be flush with the top of the pipe.

(3) surrounding concrete shall comprise a concrete bed as described above together with 150 mm concrete on both sides and on top of the pipe, giving a pipe protection of at least 150 mm concrete everywhere around the pipe.

Concreting of bedding, hunching or surround shall not be done until the pipes have been jointed, inspected and tested. The concrete shall be placed on one side of the pipe only until the flow of material under the weight placed ensures that the concrete is in full contact with the underside of the barrel of the pipe throughout its length. The concrete shall be placed in one operation and shall be well worked to a homogenous mass. The pipe shall be carefully anchored against floatation. All anchorages, haunches, surround, etc. shall be placed on and about against undisturbed earth or rock as directed by the Engineer.

PVC pipes are laid in suitable bedding material as per drawings. Protection against e.g. load from traffic is carried out by laying of concrete slabs as detailed on the drawings.

Special care shall be taken regarding compaction of fill below the concrete slabs.

6.6 Valves and Specials

Where flanged joints are used, flanges shall be as specified in Clause 6.4.1.

Where screwed joints are used, thread shall be complying with BS 21. Joints shall be flanged for sizes equal to or bigger than nominal diameter 80 mm and screwed for small sizes.

The names of manufacturers and the specifications of the products offered shall be provided at the time of tender.

6.6.1 Gate Valves and Sluice Valves

Gate (Sluice) valves shall comply with BS 5163.

The valves offered shall be with straight through openings and shall be with double faced cast iron wedges and have two machined gunmetal faces securely fixed into machined recesses.

The body of the valves shall withstand a pressure equal to or greater than the test pressure of the line and the valve seat shall withstand a pressure equal to or greater than the working pressure of the pipeline. All gate valves and sluice valves installed in sections of the pipeline having a working pressure below 1 N/mm2 shall have a rating of PN 10 (100 metres head). Valves installed in sections of pipeline having a working pressure between 1 N/mm2 and 1.6 N/mm2 shall be valves with a rating of PN 16.

For pipelines having working pressure higher than 1.6 N/mm2, BS 5151 shall apply.

Materials shall be Cast Iron for sizes equal to or bigger than Ø 80 mm with flanged joints, and cast Iron or Brass for Smaller sizes with screwed joints.

The valves shall be with non-rising spindle and shall if not otherwise stated be supplied with hand wheels.

Hand wheels shall be of cast iron, and shall have cast on the upper side of the rim, words "OPEN" with appropriate direction arrows.

6.6.2 Butterfly Valves

Butterfly valves shall comply with BS 5155. The valves shall be of the "Tight shut-off type" and shall be of either the double flanged or the wafer types with metal-to-metal seating.

The minimum service rating shall be PN 2.5. Care shall be taken when installing water type butterfly valves to ensure that the door when open does not fold the connecting pipe bore or any other adjacently connected valve or fitting.

The valves shall be lever operated and shall be marked with arrows showing "Open" and "Closed" positions.

Where the valve is mounted in a horizontal pipe with the shaft horizontal, it should be fitted in the pipeline so that the lower portion of the disc moves in the same direction as the flow when opening the valve.

6.6.3 Non Return Valves (Reflux or Check Valves)

The valves shall comply with BS 5153, and shall be of the swing pattern type.

The pressure rating shall be NP 16 corresponding to a working pressure of 1.6 N/mm2 (160 metres head).

Material to be Mechanite Iron or Cast Iron for sizes equal to or bigger than Ø40 mm, and Bronze or Brass for smaller sizes.

6.6.4 Air Valves (Small Orifice)

Standard small orifice type with inlet ferrule screwed Ø25 mm BSP taper male e.g. M/S Neptune Glenfield Cat. No. 1250 with an outlet orifice diameter of 2.25 mm and an operating pressure not less than 1.6 N/mm2 (16 bar).

For pipelines having working pressures higher than 1.6 N/mm2 the valves shall have an operating pressure of not less than 2.5 N/mm2 (250 m head).

6.6.5 Air Valves (large orifice and double acting)

Double large orifice air valves as Glenfield Cat No. 1271 shall be manufactured of cast iron and shall have a minimum nominal diameter of the inlet of 80 mm. Working pressure shall be not less than 1.6 N/mm2 (160 m head). For pipelines having working pressures higher than 1.6 N/mm2 the valves shall have an operating pressure of not less than 2.5 N/mm2 (250 m head).

6.6.6 Float Valves or Ball Valves

Working pressure to be minimum 1.0 N/mm2 (100 m head) if not otherwise specified on the drawings and in the Bill of Quantities.

Capacities and dimensions to be as specified on the drawings. Dimensions indicated are the diameters of the inlet to the float valve. types: Portsmough screwed (Ø15 to Ø50 mm) (BS 1212) Single or Double Beat Equilibrium Angular, flanged (Ø50 to Ø150 mm).

6.6.7 Constant Flow Valves

Constant Flow Valves or flow regulators are to be of flexible orifice type or other approved type with an accuracy of discharge flow of plus or minus 10% of the nominal flow-rate, at least up to a pressure of 1 N/mm2. Flow rates to be as shown on drawings.

6.6.8 Main Water Meters

Woltmann type with metric clock type registration, supplied with blank cover to replace mechanism. Ends to be flanged. Where reducers (tapers) are required, special reducers which provide identical overall lengths for varying sizes of meters to be used.

6.6.9 Penstocks or Sluice Gates

Penstocks shall be single faced cast iron gates with non-rising spindle complete with extension spindle and removable hand wheel all of approved manufacture.

6.6.10 Draw-off Taps and Stopvalves

All draw-off taps (bid-taps, hose-taps etc.) shall comply with BS 1010, and shall be made of brass. If specified in the drawings or Bills of Quantities the taps shall be chromium plated.

6.7 Auxiliary Works

All works specified in this clause shall be with materials and workmanship as specified in Section 5: Builders Works.

6.7.1 Valve Chamber

Unless otherwise directed or detailed all valves, meters and other mechanical fittings shall be housed in chambers with lockable covers.

Valve work shall be so placed in chambers as to facilitate operation, meter reading etc. through the cover opening.

Chambers are measured in numbers and shall be priced as lump sum items covering all composite work as specified on the drawings inclusive of excavation in excess of trench excavation, concrete supports for valves, anchoring walls and backfilling around the chambers.

The depths stated on the drawings are nominal depths. Actual depths depend n depth of pipes.

6.7.2 Thrust Blocks and Anchors

If not instructed to do otherwise, the Contractor shall provide thrust blocks at all bends, tees, end and wherever shown on the drawings.

Enlargements shall be excavated in sides and bottom of the trench to accommodate anchorages and thrust blocks.

Concrete thrust and anchor blocks shall be formed in accordance with the typical sections shown on the Drawings or as directed by the Engineer. The additional excavation shall be made after the bends etc. have been jointed and the concrete shall be placed immediately after the completion of the excavation.

The back of supports and blocks shall abut on to solid ground, all loose material being removed before concreting.

The concrete used for thrust and anchor blocks shall be of Grade 20 and shall after placing be kept in view for not less than six hours. No pressure shall be applied in any section of mains until the concrete has cured at least three days.

All PVC material shall be wrapped with two layers of bituminous felt for the entire length in contact with concrete. Thrust blocks are measured in numbers and shall be priced as lump sum items covering all necessary works and materials together with excavation, backfilling and formwork.

Anchoring walls for valves are parts of the valve chambers and are included in the lump sum for valve chambers.

6.7.3 Road Crossings

When the contractor encounters a road where a "Road Crossing" is indicated on the drawings or where to his opinion, such a crossing is required, he shall immediately inform the Engineer. On receipt of the above information, the Engineer will issue appropriate instructions.

6.7.4 Painting

Painting and other protection of the external and internal pipe surfaces shall be in accordance with manufacturer's recommendations or as specified in Section 5 of these specifications.

6.8 Testing of Pressure Mains

Pressure pipelines (together with all specials and valves incorporated in the mains) shall, before being covered, be tested with water as specified in CP 310.

At least two days notice must be given in writing to the Engineer before pressure testing is commenced.

6.8.1 Water Pressure Test

The water test pressure to be applied will be 1.5 times the nominal working pressure for the class or pipe being tested. The Engineer, however, reserves the right to alter this figure.

Pressure testing of pipelines is not allowed against a closed valve.

Mains shall be filled and tested in section of convenient lengths, which must not exceed 500 metres. Where pipes are laid with steep gradients the length of pipes tested at any one time shall be as directed by the Engineer.

The ends of pipes under test shall be closed by means of caps or blank flanges provided by the Contractor. Gate valves must not be used for this purpose. All scour valves and air valves shall be replaced by blank flanges before commencement of the test.

After laying, jointing and anchoring, the main should be slowly and carefully charged with water so that all air is expelled, allowed to stand full for several days and then be tested under pressure. The test pressure shall be applied by means of a manually-operated test pump connected to the main and to two parallel installed pressure gauges calibrated at an approved testing laboratory. The test pressure shall be maintained for five hours, and if there is any leakage, it shall be measured by the quantity of water pumped into the main in order to maintain the test pressure.

The permissible leakage of water which is given in imperial units in CP 310 as 1 gallon per inch of diameter per mile per 24 hours per 100 ft head is (in metric units): 0.0375 litres per mm diameter per 1000 m length per 24 hours per 10 m head of Water.

The above maximum permissible leakage approximately corresponds to the following quantities of water per 100 m length of pipe and 100 m head (1 N/mm2).

Nominal diameter of pipe	Maximum amount of water pumped per hour at 100 m head per 100 m length of Pipe
Ø50 mm	0.08 litres
Ø80 mm	0.12 -
Ø100 mm	0.16 -
Ø150 mm	0.24 -
Ø200 mm	0.32 -
Ø250 mm	0.40 -
Ø300 mm	0.48 -

Should leakage of water occur at the joints, the joint shall be re-assembled to eliminate such leakage or, should this not prove possible, the Contractor shall supply and assemble new joints. Should any pipe or joint burst or should water leak or

weep through the body of a pipe or joint, the Contractor shall forthwith remove the faulty pipe of joint and replace it with a faulty pipe or joint. In all the above cases the length under test shall be re-tested as above described and the process repeated, if necessary, until the pipeline satisfactorily withstands the prescribed test.

The contractor shall provide labour, install and work the test pump, pressure gauges and all other equipment required for the test, and he shall fill the pipes with water and subsequently empty them after the test, all to the approval of the Engineer. Water drained from the pipes shall be discharged in a way that does not affect the stability of the Works or adjacent structures.

The Contractor shall allow for all expenses in connection with testing in his rates for pipe laying.

6.8.2 Testing of Distribution System

If required by the Engineer, the Contractor shall carry out and/or assist with the testing of the completed distribution system as directed by the Engineer in order to establish the flow characteristics of the pipelines as built.

The Contractor shall provide all transport, labour and other assistance requested by the Engineer, and the Contractor shall take delivery, install, remove and make good in connection with the installation of gauges and meters etc. for the purpose of the test.

6.8.3 Testing of Sewer Pipes

All pipes and fittings shall be tested before being backfilled. The lines shall be tested in lengths between manholes or such shorter lengths as the Engineer may approve and in all cases the tests shall be applied in the presence and to the satisfaction of the Engineer or his representative.

The testing shall be carried out as specified in CP 301.

The requirements of CP 301 correspond to the amounts of water indicated below.

Nominal diameter of pipe	Maximum amount of water added per 30min. per 100m length of pipe
Ø 100 mm	3.0 litres
Ø 150 mm	4.5 -
Ø 230 mm	7.0 –

Any length of pipeline which is found to be defective shall immediately be put in a sound and satisfactory condition by repairing any defective part - or if necessary by relaying the whole of the defective length and again testing, and so on until the test is satisfactory. Any pipe found to be partly or totally cracked after laying shall be replaced by another, unless the Engineer should approve the adoption of an alternative method of repair.

If the Engineer should suspect that a pipeline has been damaged during concreting or backfilling, he may order the Contractor to retest the suspected length. Should the re-test indicate that the line is no longer capable of withstanding the press ribbed tests, the Contractor shall forthwith search for and repair the damage and re-test the pipeline until a satisfactory test is obtained.

All manholes must be constructed to be watertight. In general, manholes will be inspected visually and not be tested, but the Engineer reserves his right to direct the contractor to test the manholes before backfilling the surrounding excavation in order that any necessary works of repair may be carried out prior to backfilling. Any such tests shall be carried out in accordance with such directions as the Engineer may issue.

The Contractor shall provide ample expanding stoppers for each diameter of pipe to be laid, together with such up stand tubes, U-tubes, pumps, labour and all required testing apparatus to the approval of the Engineer.

The Contractor shall be responsible for adequately strutting stoppers when pipelines are subjected to a water test, and he shall take adequate precautions to ensure against any stopper or strutting being carried into a downstream, pipe when the water is released.

The Contractor shall allow for all expenses in connection with testing in his rates for pipe laying.

6.9 Cleaning and Sterilization of Water Supply Pipes.

The Contractor shall before handing over and during the Maintenance Period clean pipelines, chambers and manholes for all dirt and rubbish.

All pipes shall be thoroughly cleaned and washed out to remove all contamination, and all water from these operations shall be removed and drained away.

Sterilization should be carried out in accordance with CP 310.

Following the satisfactory cleansing, the Contractor shall with the use of a portable dosage system - or by some other approved method introduce a solution of a sterilizing chemical containing chlorine into the pipeline. The solution shall be introduced at a very slow rate and shall be of such strength as to give a chlorine concentration of not less than 50 parts per million throughout the length of the pipelines.

All taps on the distribution pipes shall be opened successively, working progressively away from the place where the solution is introduced. Each tap shall be closed when the water discharged begins to smell of chlorine. The whole system shall then remain charged for 24 hours, after which a test shall be made for residual chlorine. If no residual chlorine is found, the sterilization process will have to be carried out again, until a satisfactory result is obtained. Finally, the pipes shall be thoroughly flushed out and recharged with supply water.

On completion of the sterilization process the pipes shall be left full of water.

The Contractor shall in his rates for pipe laying include all costs of labour, transport, materials, equipment, chemicals and water necessary for the satisfactory completion of the cleansing and sterilization operations.

7.0 PLUMBING AND DRAINAGE

7.1 General

All materials and workmanship not described in this section are deemed to comply with the relevant specifications of the work in hand contained in other sections of these specifications.

Testing, cleansing and sterilization are to be carried out as specified in Section 6 - Pipe works.

All work shall comply with CP 310, CP 301 or CP 308.

7.2 Plumbing

The entire Works must be carried out in strict accordance with the Local Authorities. By-laws and to the satisfaction of the Engineer.

The Contractor shall be responsible for providing cleaning, storing, fixing and testing of all the plumbing fittings.

7.2.1 Tubing

Galvanized mild steel tubing shall comply with BS 1387 "Medium" wit screwed and socketed joints made in approved jointing compound.

Fittings for same shall be galvanized malleable iron to BS 143. Pipes shall be cut by hacksaw or other method which does not reduce the diameter of the pipe or form a bead or feather, which might restrict the flow of water.

Copper tubing shall be light gauge, to conform to BS 2871, and the fittings shall be capillary or compression fittings of approved manufacture complying with BS 864: Part 2.

All brass work and fittings shall be in accordance with BS 1010 for draw of taps and stop valves and BS 1212 for ball valves.

All tubing described as chased into walls shall have the wallface neatly cut and chased, the tubing wedged and fixed and plastered over.

All formed bends shall be made so as to retain the full diameter of the pipe.

Bends shall be formed with approved tools to an internal radius of not less than eight times the outside diameter of the pipe.

In general, bending of tubes shall only take place when suitable fittings are not available, and unions shall be incorporated in the system in order to facilitate easy repair or augmentation to the system.

The Contractor may use copper tubing in place of galvanized tubing for cold water services. However, if copper tubing is adopted, the Contractor in his Tender is deemed to have allowed for copper for copper couplings, bends, tees, etc.

7.2.2 Cold Water Storage Tank

Cold water storage tanks shall be of galvanized steel as shown in the drawings and shall be supplied with a galvanized sheet iron or fiber-glass removable dust covers with edges turned down 25 mm to suit the exact size of tanks.

7.2.3 Sanitary Fittings

Connections to sanitary fittings shall be made with a 450 mm copper tubing bent to shape as required with copper to iron couplings at each end.

All sanitary fittings shall be as specified in the Drawings and Bills of Quantities.

All waste fittings shall be provided with copper "s" or "p" traps, complying with BS 1184, minimum size 40 mm. They shall be properly connected to tails of waste fittings with screwed or other approved joints, and be complete with openings for cleaning. Traps to sinks shall be unpolished, and those to lavatory basins shall have a chromium-plated finish.

7.2.4 Cast Iron Soil and Ventilation Pipes

The soil, waste and vent pipes shall be coated cast iron spigot and socket pipes to BS 416 medium grade.

Pipes described as fixed to walls are to be secured at least 25 mm clear of finished wall surface with strong cast iron holder bat clamps in two sections bolted together, one section to have lewised end for building into walls, fixed not more than 2 apart.

Pipes shall be jointed with asbestos yarn and caulked with molten lead or jointed with an approved special jointing compound.

Ventilation pipes shall normally be brought up above the roofs and shall be fitted with an approved galvanized wire grating.

Where a ventilating pipe passes through a roof, the Contractor shall provide a 24 gauge galvanized sheet metal flashing of approved size to suit the roof dressed tightly against pipe and over and under roof finish - and sealed to the Engineer's approval.

7.2.5 Manholes

Manholes shall be constructed on sewer lines in the positions indicated, or wherever ordered by the Engineer.

The manholes shall be constructed in accordance with drawings of typical and special manholes.

Manholes on pipe sewers shall be constructed with an insitu base in concrete Grade 15, which shall be raised to form the benching and invert of the manhole. The benching and channels shall be carefully formed to shape according to the number, diameter and positions of the incoming and outgoing pipes. The channels shall have circular inverts. The benching shall be sloped towards the channels at a gradient of 1 in 6, or as otherwise detailed on the drawings.

Benching shall be carried out in concrete Grade 15 and rendered with 1:3 cement mortar. The ends of all pipes entering and leaving the manholes are to be carefully cut to shape to suit the internal dimensions of the manholes. All pipes entering and leaving manholes are to be as short as possible.

Manholes of precast concrete rings to be carried out as per BS 556.

Chambers of blockwork shall be carried out as specified on the drawings. The blockwork shall be rendered internally with cement mortar 1:3.

Ladders or step irons as detailed on the drawings shall be provided in manholes deeper than 1.20 m.

7.2.6 MeasuremenT

Prices for pipes and tubbing shall include all short lengths, sockets, elbows, bends, formed bends, tees, reducing pieces and other fittings necessary for the satisfactory completion of the Works.

All pipes have been measured over all bends, tees and other fittings, and the Contractor shall include in his price for all cutting and waste.

Manholes are measured in numbers.

7.3 Drainage

7.3.1 Cast Iron Drain Pipes

Shall be coated cast iron spigot and socket pipes conforming with BS 437 in all respects, and with fittings to BS 1130. Pipes shall be jointed with asbestos yarn and caulked with molten lead or jointed with an approved special jointing compound.

7.3.2 Open Drains or Channels

Drains ad detailed on the drawings shall be constructed in the positions indicated on the drawings and to the levels and dimensions shown there-on and laid to true and even gradients. Sight rails shall be fixed at intervals not exceeding 50 metres.

The excavation for the drains shall be neatly taken out to the required levels and gradients so as to avoid any unnecessary under-filling. Where under-filling is required, it shall be laid in 100 mm layers of approved granular material, each layer being well rammed. The earth sides above the drains shall be neatly dressed off to such slope as the Engineer may direct.

The invert and sides of the drains shall - where specified - consist of precast concrete elements as specified in Section 5 and on the drawings; jointed with cement mortar, the joints being neatly struck as the work proceeds.

7.3.3 Measurement

Drain pipes have been measured over all bends, junctions and other fittings and the Contractor shall include in his prices all joints, short lengths, cutting and waste. Open drains are measured in linear metres.

8.0 EXTERNAL WORKS

8.1 General

All materials and workmanship not described in this Section are deemed to comply with the relevant specifications of the work in hand contained in other sections of these specifications.

8.2 Roads and Paved Areas

For earthworks see Section 3.

8.2.1 Subgrade

The subgrade shall be shaped to the correct cambers, gradients and levels as shown on the drawing for the full width of the crown as specified in Section 3.

All fill and top 150 mm subgrade shall be compacted to at least 100% B.S. Standard Compaction.

The subgrade shall be constructed in such a manner and to such levels that no single point deviates more than 30 mm from the stipulated levels.

Subgrade should be kept continuously drained and any damage caused by water accumulating on or running off the surface shall be made good at the Contractor's expense.

Before any material is laid on subgrade, the subgrade shall be cleaned off all foreign matter, any pot holes, loose material, ruts corrugation, depressions and any other defects due to improper drainage, traffic or any other cause and shall be corrected to the satisfaction of Engineer. if the Engineer may direct, the Contractor shall re-grade and re-compact the sub-grade to the line and level at his own expense.

The Engineer's approval of the sub-grade shall in no way relieve the Contractor of any obligations under the contract.

8.2.2 Grades Stone Base Course

Stone used for the base course must comply with the following requirements:

(i) Grading

BS Sieve	Percentage Passing
75 mm	100
65 mm	95 - 100
40 mm	0 - 5 8/2

(ii) The stones should not contain deleterious matter in them and should be free from dust, and admixtures of softer stones.

(iii) The rock from which the stones are produces should comply with following:

A.C.V. (Aggregate Crushing Value)	Not greater than 35%
L.A.A. (Los Angeles Abrasion)	Not greater than 50%
S.S.S. (Sodium Sulphide Soundness	Loss on 5 Cycles not more than 12%.

(iv) Binder material used shall be crusher fines of P.I. not greater than 8%.

Before commencing the manufacture of stones the Contractor must submit to the Engineer samples of stone he proposes to use and these when approves shall form standard for the work.

The coarse aggregate shall be transported and spread on the approves subgrade in the layer of even thickness free from segregation.

The tone layer shall be compacted with roller not less than 12/16 Mgm. of weight. Rolling should be longitudinal and shall commence from the outer edges of the road. Rolling shall continue until there is virtually no movement under or ahead of roller.

After few passes of roller the evenness of the surface will be checked and depressions shall be made good by adding additional material or otherwise as case may be and rolling continued.

When the required firmness of the layer has been obtained the void in the layer shall be filled with the binder material. The binder material shall be spread in thin layer and should be brushed and rolled down into the voids. Water shall be sprayed evenly over the surface during this process to ensure complete filling of all the void.

The finished level of the surface should be true to shape and level specified so that no point on the finished surface deviates by 20 mm of the specified levels.

8.2.3. Gravel Wearing Course (Murram Finish)

Gravel shall be from approved source and quarried so as to exclude vegetable matter, Loam, top soil or clay. The gravel must confirm to following specifications:

(i) California Bearing Ratio after 4 days soak to be 18% minimum (testing to be done as per BS 1377).

(ii) Grading for the material to be within the following limits:

Sieve Size (mm)	Passing (by Weight) Class I
40	-
28	100
20	95 - 100
14	80 - 100
10	65 - 100
5	45 - 85
2	30 - 68
1	25 - 56
0.425	18 - 44
0.075	12 - 32

(iii) Plasticity: The material should have PI (Plasticity Index) not greater than 30% and PM (Plasticity Modulus) should be between 200 to 1200.

The Contractor shall set out the lines and levels of the edges of the carriage way by means of wooden pegs or steel pins to the width and levels shown on the drawings or as directed by the Engineer. The distance between pegs shall not be greater than 20 m where road is straight and gradient uniform and not more than 10 m where the road is on horizontal curves or vertical curve.

Gravel wearing course material shall be spread in a uniform layer across the full width required and scarified so that the maximum size of any particle not greater than one half of the compacted thickness of the layer is excluded. It shall than be mixed, watered if directed by the Engineer, graded and compacted to at least 100% B.S. Compaction and graded to final level. Waterlogged gravel should be allowed to dry to its O.M.C. before it is processed and compacted.

The compacted thickness of any layer shall not exceed 150 mm and where a greater compacted thickness is required the material shall be laid and processed in two layers. Any oversize material which cannot be broken down to the required size shall be removed to a soil dump.

The tolerances on levels permitted shall be as follows:

Thickness 25 mm

Variation 3 m Straight edge 25 mm

Camber 25 mm

8.2.4 Premix (Asphaltic Concrete) Finish.

The premix surfacing shall consist of a prime coat and a 25 mm thick wearing course.

Prime Coat: The primer used shall be MC1 applied between the temperature 45EC – 85EC at the rate of 1 litre/m2.

Prior to application of the primer, the base course surface shall be brushed off at all loose material to the satisfaction of the Engineer. The Engineer may direct a light wetting of the surface with water if he may so desire to enhance the penetration.

The primer shall be spread in one even layer to the widths as shown on the drawings or as directed by the Engineer by a pressure distributor. hand spraying shall not be permitted except in small areas, when approved by the Engineer.

The primed surface of the road shall be closed to all traffic. However, where it is necessary to cross the primed area, a layer of sand or crusher fines shall be spread at the rate of 2.5 kgm/m3 along the width required.

The primed area shall be allowed to cure for 24 to 48 hours or as directed by the Engineer.

Wearing Course: The thickness of the wearing course shall be 25 mm after compaction.

The nominal size of aggregate used shall be 13 mm and nominal bitumen content shall be between 4.5 to 6.5% by weight of the mix. The bituminous binder used shall be straight run bitumen of grade 80/100 penetration.

The aggregate for premix shall consist of approved crushed stone, shall be clean and free from admixture of softer stone. The Contractor will be required to submit to Engineer samples of stone which he proposes to use, and these shall, when approved, form the standard for the work.

Before the premix is laid the existing surface shall be cleaned of all loose or deleterious material. No premix shall be placed until the surface has been approved by the Engineer.

Premix shall be laid by approved mechanical paver to correct thickness, line an camber. The mixture shall be laid at ambient temperature.

Immediately after spreading the mixture shall be compacted by a 8 – 10 tons smooth steel wheel roller and final compaction shall be done by a pneumatic tyred roller.

Any place not accessible to roller shall be compacted by hand tampers whose weight shall not be less than 12 kgm. and shall have tamping face of not more than 0.03 m2.

The premix, its material, its grading, method of manufacture, method of laying and tolerances shall comply with "Ministry of Works Standard Specification" and is available from Chief Engineer (Roads), Ministry of Roads and Public Works, Ngong Road, Nairobi.

The aggregate shall be blackstrap, hard, dense stone, free from dust, impurities or admixture of softer stone. Before commencing manufacture the Contractor must submit to the Engineer samples of stone he proposes to use, and these when approved shall form the standard for the work. If the samples are rejected, the Contractor shall be responsible for providing samples from alternative sources.

The finished surface shall be to the required gradients and cambers and shall be well rolled and neatly finished off at all kerbs and walls.

8.2.5 Paving Slabs and Kerbstones

Precast concrete paving slabs and kerbstones shall be made to the sides indicated in the Bills of Quantities and the Drawings. The casting shall be carried out as specified in Section 4 and the laying as specified in Clause 7.3.2 - Open Drains.

8.2.6 Measurement

Road works are measured as covered area in square metres. Lines of paving slabs and kerbstones are measured in linear metres, and the rates shall cover for all cutting, waste and bedding etc.

8.3 Fencing.

All fencing shall be erected in exact vertical position and to straight lines as shown on the drawings. The materials and workmanship shall comply with the recommendations in BS 1722.

8.3.1 Concrete Posts.

Precast concrete posts shall be cast of concrete Grade 20 as specified in Section 4, to the sizes shown on the drawings.

The posts shall be securely placed in preformed holes and cast in concrete to depths as shown on the drawings.

Bracings shall be provided at all corners, and at intervals of not more than 50 metres on straight lines of fencing. Maximum distance between posts is 2.5m Concrete posts and bracings are measured in numbers, and the rate shall include for supply, excavation, erection and backfilling.

8.3.2. Chain Link.

The chain link fencing shall be supplied in rolls of 2130 mm (7 feet) width and shall be with 65 mm mesh of 12 1/2 gauge, fitted to 4 rows of line wires with binding wire at 130 mm centres.

The cranked top of the posts shall be fitted with 3 strands of 12 1/2 gauge barbed wire with four point barbs at 150 mm centres. All members of the fencing shall be hot dip galvanized.

Fencing is measured in linear metres and the rate shall include waste and cutting, as well as fixings to posts and all line wires, barbed wires and binding wires.

8.3.3 Gates.

If not otherwise stated, gates shall be 4 metres wide double leaf gates, made from 40 mm galvanized steel tube frame (medium class) with 8 gauge galvanized weld mesh welded to the frame. Bracings, hinges, tow bolts and locking arrangement shall be as shown on the drawing or of other approved type. The top of the gates shall be fitted with 3 strands of 12 1/2 gauge barbed wire. The price for the gate shall include for the manufacture, installation, all bolts and padlocks etc. and painting all as shown on the drawing. Gate posts made of rolled hollow square sections as shown on the drawings are measured separately.

9.0 MECHANICAL INSTALLATIONS

9.1 General.

The workmanship and materials covered by this section shall include the supply and installation of all pumps, motors, engines and chemical dosers and ancillary equipment.

All materials and equipment shall be obtained from reputable manufacturers, who have well established agents in Kenya. The local agents shall be able to provide an efficient service of the equipment and must have ample stocks of all expendable items such as gaskets, filters, fuses, indicator lamps, coils etc.

The Engineer reserves his right to reject manufacturers or agents not fulfilling the above requirements.

It is the responsibility of the Contractor to provide evidence that the equipment is in compliance with these specifications, and that the equipment will operate satisfactorily under the conditions under which it is installed. All equipment offered shall comprise a complete installation such as bolts, gaskets, protective screens, belt guards, exhausters, painting etc. all to the satisfaction of the Engineer.

Details of concrete plinths for pumps and motors shall be supplied by the Contractor at least 6 weeks before he intends to install the equipment.

9.2 Trade Names

Subject to the provision of the preceding paragraph and anything here-after to the contrary where trade names or manufacturers catalogue numbers are mentioned in these Conditions, the reference is intended as a guide to the type of article or quality of material required.

The Contractor may use any article or material equal to type of quality to those here-in described subject to the prior approval of the Engineer and at his absolute discretion. The onus of proof as to equivalent quality will rest with the Contractor, whose Tender will be deemed to include for the makes described hereafter.

9.3 Spare Parts

The Contractor shall submit with his Tender a guarantee from the suppliers that he will hold a sufficient number of spare parts for the maintenance of the equipment.

9.4 Storage of Materials

The Contractor shall provide weather-proof lock-up sheds for the safe storage and custody of materials for the Works and shall move such sheds and make good damaged of disturbed surfaces upon completion to the satisfaction of the Engineer.

9.5 Testing

The Engineer shall be entitled at all reasonable times during manufacture to inspect, examine and test on the Contractor's premises the materials and workmanship of all Plant to be supplied under the Contract, and if part of the said Plant is being manufactured on other premises the Contractor shall obtain for the Engineer permission to inspect, examine and

test as if the said Plant were being manufactured on the Contractor's premises. Such inspection examination or testing if made shall not release the Contractor from any obligation under the Contract.

The Contractor shall carry out at his own expense any tests he may deem necessary to satisfy himself upon the quality of materials and workmanship.

Performance tests shall be carried out for all mechanical and electrical equipment to ensure that the equipment comply with the specifications.

The duration of the performance tests shall be 24 hours.

The Contractor shall include for the necessary labour and instruments, for carrying out these tests, and he shall be responsible for the discharge of water during tests.

All tests are to be carried out in the presence of the Engineer or such other person appointed for this purpose.

The Contractor shall give the Engineer reasonable notice in writing of the date on and the place at which any Plant will be ready for testing as provided in the Contract and unless the Engineer shall attend at the place so named within 10 days of the date which the Contractor has stated in his notice the Contractor may proceed with tests, which shall be deemed to have been made in the Engineer's presence, and shall forthwith forward to the Engineer duly certified copies of the test readings. The Engineer shall give the Contractor 24 hours notice in writing of his intention to attend the tests.

9.6 Drawings

The Works shown on the drawings are for tendering purposes only and it is the Contractor's responsibility to provide detailed drawings of the Works he proposes to use. It is the Contractor's Responsibility to see that all openings, recesses, channels, conduits etc. in the structures are so located and installed as to fit and function properly with the mechanical and electrical installations.

The Contractor shall include in his rates for the preparation of all necessary detail or workshop drawings required for the manufacture and erection of the installation and such drawings are to be submitted to the Engineer for approval prior to the commencement of manufacture or installation.

Upon completion of the Works the Contractor shall submit "as built" drawings to the Engineer for his approval.

The Contractor shall be responsible for any discrepancies, errors, or omissions in the drawings and other particulars supplied by him, whether such discrepancies, errors, or omissions be not due to inaccurate information or particulars furnished in writing to the Contractor by the Employer or the Engineer. The Employer shall be responsible for drawings and information supplied in writing by the Employer or the Engineer and for the details or special work specified by either of them. The Employer shall pay any extra cost reasonable incurred by the Contractor due to any alterations of the Work necessitated by reason of inaccurate information so supplied to the Contractor.

9.7 Description of Services

The Contractor shall supply, transport, deliver, install, connect, commission and hand over all equipment and materials specified in the Specifications, Drawings and Bills of Quantities, in a clean, complete and in every detail working condition. He shall carry out all tests specified in these Specifications or in relevant British Standards together with any test which might be requested by the Engineer in connection with the use of special materials or equipment. Furthermore, the Contractor shall provide Guarantee, of the Employer's Staff.

Initial Free Maintenance, Instruction Manuals and careful instruction Cost of all the before mentioned materials and services together with all necessary labour, overheads and profits, duties, sales tax, etc. shall be deemed to be included in the rates entered into the Bills of Quantities.

9.8 Maintenance

The Contractor has the liability for defects and shall maintain all Works, equipment and electrical installations for a period of twelve calendar months from the date that the works are handed over to the Employer and shall be responsible for the initiation and execution of the Employer's planned programme of maintenance during this period.

All expendable items, such as gaskets, filters, fuses, indicator lamps, relays, coils, switches, oils, tests etc are to be supplied by the Contractor.

In case permanent power supply is not made available in time for testing various equipment, the Contractor, if he intends to clear out the site, should make his own arrangement for testing the equipments and should again return to site for final testing when permanent power is made available. No extra payment will be made for the above.

The Contractor shall be held responsible for and shall make good all defects in materials and workmanship that appear during the maintenance period. The period of liability shall not end until all defects which appear during the maintenance period have been rectified. In the event of equipment being out of operation due to breakdown for a duration exceeding one week, the maintenance period for that equipment will be extended with a period of one same duration.

9.9 Initial Maintenance Period

The Contractor shall during the twelve months maintenance period carry out necessary adjustments and repairs, cleaning and lubricating etc. A report of any work done shall be submitted to the Employer and incorporated in the maintenance records.

The Contractor shall inform the Employer before any routine maintenance inspections are carried out, so the Employer can have staff available to attend. Any item of material found to be defective shall be replaced by the Contractor within seven days of being notified and any results or defective workmanship shall be rectified including the supply of new parts if necessary.

The Contractor shall allow in his contract price for the maintenance and inspection service and shall provide for all labour, tools, instruments and plant and the transportation thereof, as required for the satisfactory execution of these obligations, and for the provision, use and installation of all materials such as oils, greases, etc. and parts which are periodically renewed such as relay contracts or parts which are faulty for any reason.

9.10 Maintenance and Servicing after Completion of the Initial Maintenance Period

The Contractor shall if requested enter into a maintenance and service agreement with the Employer for a period of up to five years from the last day of the maintenance period. Such an agreement shall offer the same services as specified above under "Initial Maintenance Period".

9.11 Maintenance Manual

Upon completion, the Contractor shall furnish to the Engineer six copies of a manual size A4 of loose leaf type containing all the following items:

a. Description of equipment.

b. Full operation and maintenance instructions.

c. Valve operation.

d. Fault -finding chart.

e. Emergency procedure

f. Maintenance and service period

g. Lubricating instruction.

h. Colour code legend

i. Primary and secondary spares

j. Recording drawings - size A4.

The manual shall be specially written and not a standard manufacturer's manual unless approved by the Engineer.

Tags giving instructions are not sufficient. All instructions shall be written into the manual with reference to the drawings. All valves, terminals and controls on the plant shall be labelled to correspond with the maintenance and operation manual. The Works shall not be considered to be completed for purpose of taking over until such instructions and drawings have been supplied to the Employer.

9.12 Motors

All motors shall unless otherwise stated be suitable for a 415/240 Volt, 3 phases, 50 cycles, 4 wires power supply, and shall be executed for star-delta starters as specified.

The motors shall be constructed in accordance with CP 1015, and shall be protected as specified in Section 10 - Electrical Works.

The motor speed shall not exceed 2900 R.P.M.

The motor shall be foot mounted squirrel cage, drip-proof, or totally enclosed suitable for an ambient temperature of 30EC. The motor shall be designed for continuous running. Each motor shall be capable of an overload of 10% above it's rated output at the rated voltage for a period of one hour without sustaining damage.

The rated output of the motor shall be the maximum horsepower absorbed by the pump under the described condition of head and discharge, plus an allowance for loss of power in couplings etc.

Electrically driven pumps shall if not otherwise stated be directly coupled via flexible couplings to the motors, and motors and pumps shall be fitted to common rigid steel frames bolted to concrete plinths.

Proper alignment of motor and pump must be guaranteed.

9.13 Engines

The engines shall be of the diesel type with a maximum speed of 3000 R.P.M. designed for continuous running.

The engines shall be directly coupled via flexible couplings to the pumps. Engine and pump must be fitted to common rigid steel frames bolted to concrete Plinth. Proper alignment of engine and pump must be guaranteed. The engines shall be supplied with hand starter, couplings, tachometer, hand throttle control, hand stop control, silencer, fuel tank for at least 300 hours running of one of the engines and necessary tool kit for minor repair.

9.14 Pumps

The pumps shall be of the centrifugal type with cast iron casings. The shaft shall be prepared for direct connection via flexible couplings to the motors.

Pump casings shall have interchangeable bronze wear rings. The impellers shall be of bronze or high grade cast iron dynamically balanced to ensure smooth running.

The impeller shaft shall be of steel and fitted with renewable bronze protecting sleeves wherever it is in contact with the pumped water. Mechanical seels shall be provided unless approved otherwise. It shall be stated in the tender documents if other materials are

offered.

For horizontal type pumps, the impeller shaft shall be carried by oil or grease lubricated ball/roller bearings of heavy duty type.

The pump casings, bearings, shaft, impellers and gaskets must be executed of materials suitable for many years continuous operation in a water system. If materials other than cast iron, bronze or stainless steel are included in the pump, it cannot be approved unless a written guarantee for 10 years performance is produced, giving free replacement including labour in case of fault.

All pipe connections shall be flanged, and prices shall include for the necessary tapers, gaskets, bolts, etc. for connecting up to the pipe diameters shown on the drawings.

The pump type and size shall be chosen so as to ensure that the pump is working with an efficiency of not less than 90% of the peak efficiency. Performance curves, efficiency curves and power demand curves shall accompany the tender, with clear indicator of the capacity and efficiency for the pump with the specified head.

9.15 Chemical Dosing Equipment

The chemical dosing equipment shall consist of gravity dosers, tubes and connections as shown on the drawings.

The type of principle of dosing shall be as per Messrs Paterson Candy International's "Gravity Solution Feeders type FRN 2" or of a similar approved type.

The prices entered in the Bill of Quantities shall cover for the complete installation (chemical tanks excepted). Any item not mentioned in the Bills of Quantities shall be deemed to be covered by the other rates.

9.16 Pressure Gauges

The pressure gauges shall be wall mounted gauges in metric units completed with connection to delivery side of pumps, copper pipe from pipe to gauge supplied with isolating cock.

10. ELECTRICAL WORKS

10.1 General

The quality of materials and workmanship specified in this section is for all items forming part of the electrical installation as shown in the Drawings, Bills of Quantities and these specifications.

10.2 Regulations

All the Electrical Works shall be carried out strictly in accordance with the following:

(i) The 13th Edition of the "Regulations for the Electrical Equipment of Buildings" issued by the Institute of Electrical Engineers of Great Britain with Kenya amendments.

(ii) The Licence's By-Laws.

(iii) The Government Electrical Specification (G.E.S No. 1 and No. 2).

(iv) The Power Act.

(v) Relevant British Standard Specifications and Codes of Practice published by the British Institution (here-in-after referred as BS and CP, respectively).

(vi) The Specification.

(vii))The Contract Drawings and the working drawings, produced by the Contractor and approved by the Engineer.

(viii) The Engineer's instructions.

The Contractor shall undertake all modifications demanded by the authorities in order to comply with the regulations, and produce all certificates, if any, from the authorities without extra charge.

After completion of the work, the Contractor shall deliver a complete set of "as built' drawings showing the complete installation including all alterations and modifications. The set of drawings shall include but is not limited to all floor plans and diagrams.

10.3 Materials

All materials, fittings and accessories are to be new and in accordance with the requirements of the current rules and regulations where such exist, and with the relevant British Standard Specification.

Uniformity of type and manufacture of fittings or accessories is to be preserved as far as practicable throughout the whole work.

Wherever in this Specification the practice is adopted of specifying a particular item as "similar" to that listed in a particular firm's catalogue, it is to be clearly understood that this sis to indicate the type and quality of the equipment required. No attempt is being made to give preference to the equipment supplied by the firm whose catalogue is quoted.

Where particular manufactures are specified here-in, no alternative makes will be considered without weighty reasons and the Engineer shall have the right to reject any other makes.

The Contractor shall if required by the Engineer submit samples of materials for their approval, before placing an order.

The Contractor will be entirely responsible for all materials, apparatus, equipment etc. furnished by him in connection with his work, and shall take all special care to protect all parts of finished work from damage until handed over to the Employer.

The work shall be carried out by competent workmen under skilled and experienced supervision. The Engineer shall have the right to have any part of the work taken down or changed at the Contractor's expense, which is executed in an unsatisfactory manner.

Such materials supplied by others for installation and/or connection by the Contractor shall be carefully examined before installation and connection. Any defects noted shall immediately be reported to the Engineer.

10.4 Workmanship

The routes of services and approximate positions of apparatus are shown on the Contract Drawings, but their exact positions shall be determined by approved dimensional details on working drawings or on site by the Engineer in consultation with the Contractor.

The Contractor shall ascertain on site that his work will not foul other services and in all cases the services through the ducts must be readily accessible for maintenance. Any work which has to be re-done due to negligence in this respect will be his responsibility.

The Contractor will be deemed to have allowed in his tender for locating terminal points of services (e.g. lighting switches, socket outlets, lighting points) in positions 1 metre horizontally and vertically from the locations shown on Contract Drawings. Within these limits, no variation in the Contract Sum will be made unless the work has already been executed in accordance with previously approved working drawings or with the Engineer's approval.

The Contractor will be responsible for the provision of all cable products and trenches and for their installation, unless otherwise stated in the Specification or Contract Drawings.

The Contractor shall include in his tender for the plugging of all walls, ceilings and floors to facilitate the fixing of the conduits, accessories and all other portions of the electrical installations. Any purpose made fixing brackets shall also be provided and installed by the Contractor.

The contractor shall also be responsible for ensuring that runs for floor or wall chase, holes to be cut or left, will be marked out at the appropriate stage of the structural works.

The Contractor shall be responsible for all cutting away and making good.

The Contractor shall pay particular attention to the fixing and alignment of switch, socket, telephone and similar boxes.

Where conduits are concealed, the boxes shall be in an exact position relative to the finished plaster or such other finish as may be applied to enable cover plates to be accurately positioned.

10.5 Main Switchboard

The main switchboard shall be free-standing type switchboard with

front access.

The switchboard shall be constructed, fully wired, and checked out at the factory and shall require a minimum of installation work on site.

Modular construction shall be used wherever practicable, and provision shall be made for simplified servicing, replacement and maintenance throughout without major dismantling.

The enclosures shall b suitable for containing circuit breakers, motor starters and metering equipment from K P & L. Where spaces on the switchboard are provided for future circuit components, all ancillary parts shall be installed initially. Full safety precautions shall be provided in all cases.

The switchboard shall be dust and vermin proof and shall have a flexibility of unit arrangement so that extension in the future is possible.

Provision for conduit and cable entries shall be made at both top and bottom.

Removable insulated shields shall be provided for protection against contact with live parts. All panel components shall be of a sufficient mechanical strength to withstand the influences of short-circuits.

All bus bars and bus bar connections shall consist of high conductivity copper or aluminium and be provided in accordance with B.S. 159. The bus bars shall be clearly marked with the appropriate phase and neutral colours, which should be Red, Yellow and Blue for the phases and Black for the neutral. The bus bars shall be so arranged in the

switchboard that extension may be made in the future on to the sides. Bus-bars shall be rated at the nominated current of the main switch in their entire length.

All wiring within the panel shall be orderly laced and bonded to the panel structure, wiring insulation being coloured according to the colour code. Where single core cables are used, special care shall be taken to prevent hysteresis.

A high conductivity copper earthing bar shall be provided for the full length of the board and all fuse switch units and circuit breakers shall be bonded to this bar.

A wall mounted steel cabinet with a complete set of spare fuses for the Main Switchboard shall be provided by the Contractor. All switches, switch fuses, circuit breakers etc. shall be numbered with engraved plastic labels in White letters on black background.

Where wiring passes through holes in metalworks, protection by rubber pushes shall be provided.

10.6 Switchgear.

Control voltage of all contractors, automatic switchgear and motor protection gears shall be 220 to 250 V. The short-circuiting capacity of all circuit breakers, switch gears and motor control gears shall be in accordance with BS 5419.

All fused switch units shall be supplied and installed complete with Class "Q" H.R.C. cartridge fuse links complying with BS 88, and shall be contained in metal clad, dustproof, gasket sealed individual enclosures with non-detachable steel operating handles which shall be capable of being locked in the "off" position.

The fused switch units shall have fault ratings at least equal to the fault rating of the switchboard in which they are to be installed.

Moulded case circuit breakers (M.C.C.B.) shall comply with BS 4752 and the following requirements:

a) Each M.C.C.B. shall be triple pole with pole internally ganged and operated by one central toggle.

b) Each pole shall have a separate thermal and separate magnetic tripping mechanism, both of which shall preferably be adjustable. The toggle assemblies of all three poles shall be internally mechanically interlinked for simultaneous isolation of all three poles under fault conditions, and be so arranged that the overload tripping characteristics calibrations of each pole shall be completely unaffected by the loading of its neighbouring pole or poles.

c) The tripping mechanisms and calibrations shall be unaffected By fluctuating and high ambient temperature. The M.C.C.B.'s shall have a certified short circuit breaking capacity of at least 15,000 Amps (at 480 Volts and 0.3 power factor).

d) Circuit breakers of 100 A frame size and larger shall have interchangeable over current trip units and adjustable instantaneous trip units.

10.7 Motor Starters

Motor starters for the backwash pumps shall be automatic direct-on-line contractor type fitted with double pole incoming mechanically interlocked circuit breaker housed in a damp and dust proof steel enclosure.

Overload protection shall be provided by a solid state current operated relay as manufacture Omron. Backwash pump motors are arranged for remote operation, the coil circuit of the contractor being protected by a fuse. Two spare relays together with two current connectors shall be provided by the Contractor. Terminals shall be easily accessible and have adequate clearances between phase and earth. Each starter shall be fitted with start/stop bush buttons with indicator light for running.

10.8 Distribution Boards

The distribution boards shall be as shown on the relevant drawings. The distribution boards are specified as Crabtree metal clad for flush or cubicle mounting.

Where the requirement for miniature circuit breakers is indicated on the Drawings, the distribution boards shall be fitted with moulded thermo-plastic units of the combined thermal overload and magnetic short circuit tripping type to BS 3871 Part 1 having clearly marked "ON" and "OFF" Positions. MCB's of all ratings shall have a minimum short circuit current breaking capacity of 3,000 A for single pole breakers and 4,000 A for triple pole breakers.

10.9 Wiring

All wiring must be carried out in P.V.C. single core, copper cables to British Standard.

The wiring throughout shall be carried out by looping cables from point to point and no tees or other joint will be permitted. The entire wiring shall be so organized that later change and renewal can take place without cutting down structural parts. The Contractor must allow in his Tender for all measures of efficient fixing of all wiring items.

The Contractor shall comply with colour code requirements of the regulations.

Low voltage cables and medium voltage cables shall be enclose in entirely separate conduits.

All cables shall be drawn-in after the installation of the entire conduit system, and after plaster has dried out. Draw wires shall not be threaded in at the time of the conduits being installed.

Great care shall be taken to ensure that no crossed cables are allowed to enter conduits.

10.10 Cable and conductors

All cables shall be delivered to the site in their original packaging with all seals intact.

Cable dimensions shall comply with the rules and regulations and with the information given on the Drawings or in the Specification.

All cables shall conform to relevant British Standard. No cable dimensions smaller than 1.5 sq mm for light and control circuits shall be used.

Where aluminium cables are connected to copper or brass elements in switchboards, etc., an anti-corrosive paste shall be used. Common saddles shall be used where cables are grouped. All cables shall be terminated with suitable compression type cable glands of the correct size.

All low voltage cables shall be thoroughly soldered or joined with connectors of absolutely reliable type, which hold the conductors in a firm grip, without damaging the wire and without any possibility of vibrating loose.

Underground cables shall be laid in trenches excavated at a depth of minimum 600 mm below ground level in the following manner:-

The Contactor shall trim the trench bottom level and if in hard material shall lay 75 mm of sand. Cables shall be laid and covered by a further layer of sand to provide 75 mm minimum cover. Interlocking concrete or the approved cable covers indelibly marked "DANGER - HATARI" shall be provided and laid on the sand covering by the Contractor. Backfilling of the trench shall then be completed.

Cables shall be separated by minimum 50 mm of sand filling and kept a minimum of 250 mm from other services.

Cables shall cross roads and enter buildings by means of 100 mm diameter pitch-fibre or similar non-corrosive pipes. These shall be laid at a minimum depth of 850 mm and extend a distance of 600 mm on either side of road, etc. The ducts shall be provided and laid by the Contractor. The Contractor shall supply and install concrete marker posts at each entry into building, each change of direction, each road or pathway crossing and throughout the length of the cable at intervals not exceeding 50 metres. Underground ducts must be drained and ducts entering buildings shall be sealed in the end nearest to the building.

The position of all cable markers shall be agreed with the Engineer before installation.

10.11 Conduits

Plastic conduits shall be of best quality new super high impact grade, heavy gauge Class "A" rigid P.V.C. unplasticized conduit, suitable for plain connection. Conduits badly formed or bent or damaged in any way must not be used. Conduits not cast or concealed shall be galvanised steel conduits of heavy gauge Class "B" welded and screwed steel and shall comply with British Standard. In no case shall conduits smaller than 20 mm be used.

Conduits to be concealed in structures cast in-situ shall be secured to the steel reinforcement work with heavy binding wire, spaced not more than 900 mm to prevent movement of the conduit and conduit boxes during the pouring and vibrating of the concrete. Outlet boxes shall be filled with paper to prevent ingress of concrete, and all boxes shall be securely fixed to the shuttering with nails or other measurers, which must not be visible after removal of the shuttering unless they later can be concealed, e.g. by plaster. Conduit shall be installed after the first grid of steel reinforcement work has been securely fixed. All open ends of conduit shall be protected by coupling plugged with a suitable non-metallic stopping plug.

Conduit run in chases in walls or the like shall be fixed by means of mild steel pipe hooks or saddles spaced at not more than 900 mm. Where the conduit is concealed behind the plaster, it shall be sunk to a depth of 10mm below finished plaster level before application of the plaster.

Conduit fixed to the surface of walls or ceiling shall be fixed by spaced bar saddles fixed not more then 900 mm apart.

Surface conduit shall also be fixed 200 mm from boxes, the boxes themselves being securely fixed. Where such an arrangement of boxes and saddles would prove to be both unsightly and unnecessary, short lengths of conduit not exceeding 900 mm between boxes need not be secured further than by connection to the adjacent boxes. In such cases, the Engineer reserves the right to insist upon having additional fixings provided, should he for any reason whatsoever consider additional fixings necessary.

Special care shall be taken to prevent dirt and plaster to enter any section of the conduit system.

All bends in conduits shall be formed without any decrease or increase of the cross section diameter of the conduits. The radius of the bend shall not be less than as indicated by British Standard.

For concealed work, this radius should be increased. No manufactured tees, elbows and bends will be permitted. All conduits shall be thoroughly cleaned for sharp edges.

The conduits shall be installed avoiding unnecessary bends or changes in direction. Conduits shall be laid in straight lines. Where straight rows in conduit are installed, inspection boxes shall be placed at not more than 15 metres intervals. There shall be not more than 4 easy bends or 2 right-angle bends between boxes. In surface conduit systems, inspection bends may be where it seems convenient replace inspection boxes, but only with permission from the Engineer.

Not more than 6 final sub-circuit cables shall run in conduits fending outlet boxes. Not more than 8 cables running straight back to the distribution board shall be enclosed in one conduit.

Sub-mains shall not be enclosed in the same conduit as other circuits.

Lighting sub-circuits shall not be enclosed inthe same conduit as general purpose power sub-circuits.

Single phase sub-circuits shall not be enclosed in the same conduit as three phase sub-circuits.

-1/4-

10.12 Boxes.

All conduit boxes in connection with plastic conduits shall be of plastic.

Boxes installed externally shall be galvanised and where exposed to direct weather conditions, they shall be compound filled. All metal boxes shall be fitted with an earth terminal.

Deep boxes or extension rights on standard circular boxes shall be used where necessary in order to bring the front of each box flush with the ceiling or wall.

All screws for holding boxes, lids, etc., in position shall be screwed in. Adaptable boxes shall be screwed by minimum four screws. Conduits shall enter such boxes by means of conduit sockets. Joint boxes without connectors will not be allowed.

All boxes shall match to the equipment installed in the box and genuine parts produced by the same manufacturer shall preferably be used.

All necessary screws, plugs, bolts and other fixings for electrical equipment must be supplied by the Contractor and included in his tender. All fixings on concrete or stone structure shall be by means of rawlplugs or similar plugs in plastic.

All spareways in junction boxes and the like left for possible future extension shall be fitted with stopping plugs.

10.13 Light Fittings

All light fittings shall be supplied by the Contractor. The Contractor shall include in his tender for clearing, installation, connection and supply of light sources in accordance with schedule of light fittings and drawings.

Fluorescent fittings shall except where otherwise specified by phase compensated by means of a phase capacitor, LC coupling or M coupling.

Where earthing of light fittings is necessary, it is to be effected without using chains or other rigid supports as conductors.

All light fittings shall be cleaned and installed in complete working order before handing over.

10.14 Security light fittings

All external security light fittings shall be controlled by a photocell contractor located as shown in the relevant drawings.

The photocell unit shall be fixed at 2000 mm above ground level on either north or south of external wall of indicated building.

10.15 Light Switches.

Light switches shall be 5 or 20 Amp according to the load switches.

They shall be as manufacture Crabtree with ivory colour moulded covers. They shall be suitable of switching inductive loads and mounted in pressed steel boxes on adjustable grids. They shall be installed at a height of 1400 mm above finished floor level.

10.16 Meter Boxes.

The Contractor shall supply and install a standard single or Dual Tariff meter Box where called for on the Contract Drawings. The shall also provide the necessary conduits for the Kenya Power & Lighting Co. Ltd., service cable entry.

10.17 Power Installation

The installation for power shall be concealed in walls and floors in PVC conduits.

Precise position of these and control switches shall be ascertained by the Contractor.

The Contractor shall supply, fix and connect isolators to equipment as shown below.

The tender price shall be based on the following heights for isolators and socket outlets, unless specifically stated otherwise on the drawings.

Isolators 1400 mm above finished floor level.

Socket outlets flush at 250 mm above finished floor level.

All socket outlets mounted above worktops shall be flush mounted at 150 mm above worktop.

The motor installation shall include isolating switch and terminating box fixed at the wall 1400 mm a.f.l. Flexible cable shall be provided between the box and the terminal box at the motor. The flexible cable shall be installed with sufficient coils to enable "tong-test readings" for each phase.

All adaptors shall be solid bronze or brass pattern with standard thread.

10.18 Earthing and Bonding.

Earthing and bonding shall be carried out to the requirements of the current 14th Edition of the IEE Regulations and GES 1 and 2. In particular attention is drawn to IEE Regulation D5, D6, D7 and D29.

An earth electrical system shall be installed at the point adjacent to the main supply intake and at every building served by the external distribution system

Each earth electrode shall be 12 mm diameter copper rod driven to a depth of 1300 mm. In rocky solid conditions, where this depth is difficult to obtain, the Contractor shall obtain written approval from the Engineer for an alternative earth electrode system.

The electrode shall be connected via a green PVC insulated copper to an earth terminal adjacent to the incoming supply, to which all cable armouring, conduit, trunking, switchgear etc, shall be bonded, together with all other metallic incoming services, e.g. water etc.

provision shall also be made for connection with the neutral of the incoming supply.

Where P.M.E. is approved and after the Supply Authority has made its connection, the Contractor shall similarly connect the neutral of each distributor main to earth at its remote end. The bonding of other services or connections of neutral to earth shall be made after satisfactory completion of earth continuity and line earth loop impedance test. Tests of the resistance to earth of each electrode system shall also be carried out and the results recorded.

The maximum reading shall not exceed that laid down by Kenya Power & Lighting Co. Ltd., and in any case shall not exceed 2 ohms. Means shall be provided, e.g. a test clamp, to isolate he electrode from the system for periodic testing. Internal earthing and bonding shall comply with the current edition of the IEE Regulations except that insulated switches and lighting fittings need not be earthed from a safety aspect. Certain fittings, however, may require to be earthed to effect proper operation.

All cable glands for SWA underground type cable, where installed, shall be fitted with an approved earthing washer having a tag for the connection of an earth lead. Every such washer installed shall be connected by an insulated earthing lead to a proper earthing terminal by means of a lug or washers on the adjacent switchgear or other equipment.

Original

TO: CONTRACTING AUTHORITY,

ITALIAN DEVELOPMENT COOPERATION

DATE: 28 of May 2020

SUBJECT: Rehabilitation of Saudi Maternity Hospital - K_05

We are pleased to submit our Financial Offer for "Rehabilitation of Saudi Maternity Hospital - K_05"

The offer consists of:

Serial	Projects Name	Financial Offer(Euro)
1-	PACKAGE 2- OT (OPERATING THEATRE) | BLOCK E	586,699.03 €
2-	PACKAGE 4- IPD (delivery department) | BLOCK H & I	192,207.49 €
3-	PACKAGE 6- IPD (WARDS 01) | BLOCK D	324,232.24 €
3-	Total amount before discount	1,103,138.76 €
4-	Discount 5%	55,156.94 €
5-	Total after Discount	1,047,981.82 €

Hope that our offer meets your esteemed organization expectations.

Ibrahim Bakri Mohamed

Manager, Planning & Business Development

AGENZIA ITALIANA PER LA COOPERAZIONE ALLO SVILUPPO

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Original

REHABILITATION OF THE SAUDI MATERNITY HOSPITAL KASSALA HEALTH CITADEL - SUDAN **BOQ - BILL OF QUANTITY** **PACKAGE 2- OT (OPERATING THEATRE) | BLOCK E**		
CODE	**DISCIPLINE**	**VALUE**
1	Architectural	194,557.47 €
2	STRUCTURES	31,461.59 €
3	WATER SUPPLY SYSTEM	5,007.85 €
4	WASTEWATER DRAINAGE SYSTEM	14,410.00 €
5	STORMWATER DRAINAGE SYSTEM	6,966.00 €
6	FIREFIGHTING WATER SYSTEM	16,274.70 €
7	ELECTRICAL INSTALLATIONS	71,308.50 €
8	INFORMATION & COMMUNICATIONS TECHNOLOGY (ITC)	26,890.92 €
9	AIR CONDITIONING AND VENTILATION	175,131.00 €
10	MEDICAL GASES	39,551.00 €
11	FIRE SAFTY	5,140.00 €
TOTAL		**586,699.03 €**

Original

Project: Rehabilitation of the Saudi Maternity Hospital	**Location:** Kassala Health Citadel, Sudan	amps
Date: 31 January 2020	**UNOPS**	

BILL OF QUANTITIES-PACK 2-ARC

NOTES:
1. The articles include all the preparatory and basic work, including all the materials and accessories, required for their execution and perfect finish.
materials to be demolished or removed shall be considered as reusable and all necessary actions must be taken for their perfect conservation and placed in storage or in the successful tenderer's outlet, all according to the indications of the inspection.
2. All

*a.w-all works
**n.a- non applicable

Grand Total-PACK 2-ARC 194,557.5

Art*	Description of works	Un.	Quant.	Unit Price	Total
CHAPTER A - CONSTRUCTION SITE					
1.	Construction site assembly and disassembly, including plate construction site identifier and fencing; provisional installations namely for the developer; supervision; materials warehouse; equipment and tools; facilities for personnel services; sanitary facilities; provisional networks	a.w	1	2,000.0	2,000.0
2.	Implementation and development of the health, safety and security plan.	a.w	1	1,500.0	1,500.0
3.	Implementation and development of the prevention, construction and demolition waste management	a.w	1	2,000.0	2,000.0
4.	Execution of the final cleaning of the work, including all the necessary work and removal from the contractor's deposit of surplus products	a.w	1	1,000.0	1,000.0
CHAPTER B - DEMOLITIONS					
1.	Demolition element by element from the roof, of all the elements proposed for demolition, including removal single element with temporary shoring if necessary, removal and classification of debris and waste, for subsequent transport to the authorised outlet, all necessary work, materials and equipment.	a.w	1	1,500.0	1,500.0
2.	Execution of all necessary survey work/ disassembly of water installations and equipment, existing sewers, electrics, telephone, etc., including loading, carriage to and unloading of all cargoes materials.	a.w	1	1,000.0	1,000.0
3.	Demolition of existing brick walls, according to demolition plan, including removal of products from demolition, to dumping ground, to any distance	a.w	1	1,500.0	1,500.0
4.	Demolition of existing indoor and outdoor doors and windows according to demolition plan, including removal of products from demolition, to dumping ground, to any distance.	a.w	1	500.0	500.0
5.	Execution of demolition of existing indoor floors of ceramic tiles, for subsequent application of new coatings including removal of products from demolition, to dumping ground, at any distance.	a.w	1	500.0	500.0
6.	Execution of removal of existing bathroom fittings, including removal of products from demolition, to dumping ground, at any distance.	a.w	1	500.0	500.0
7.	Existing walls to be demosidhed according to demolition plan	m2	830.47	0.5	415.24
CHAPTER C - GENERAL CIVIL AND INFRASTRUCTURE CONSTRUCTION					
1	WALLS				
1.1	Exterior Walls				
1.1.1	P1 -nominated on the project as Skin Wall; baked terracota pieces (please see detail on shett A.05.02)	m2	92.22	50.0	4,611.0

AGENZIA ITALIANA PER LA COOPERAZIONE ALLO SVILUPPO

Original

Continuation of chapter C

1	WALLS				
1.1	Exterior Walls				
1.1.2	P2- nominated on the project as Thermal Block; 20cm thermal clay brick with massive btick exterior covering (please see detail on shett A.05.02)	m2	72.68	35.0	2,543.80
1.2	Interior Walls				
1.2.1	P3-Internal mineral insulation liner with plasterboard covering (please see detail on shett A.05.02)	m2	99.48	18.0	1,790.64
1.2.2	P4- Interior plasterboard partition (please see detail on shett A.05.02)	m2	63.68	25.0	1,592.0
1.2.3	P5- 11 cm brick double plastered (please see detail on shett A.05.02)	m2	493.25	27.0	13,317.75
1.2.4	P6- 15cm brick double plastered (please see detail on shett A.05.02)	m2	234.26	30.0	7,027.80
1.2.5	P7- 20cm brick double plastered (please see detail on shett A.05.02)	m2	n.a	30.0	
2	FENCE				
2.1	Proposed:nominated on the project as Skin Wall; with baked terracota pieces (please see sheet number: A.05.03- Constructive Details,Walls Fence)	m/l	n.a	70.0	
2.2	Future Expansion: nominated on the project as Skin Wall; with baked terracota pieces (please see sheet number: A.05.03- Constructive Details,Walls Fence)	m/l	n.a	50.0	
3.	COATINGS				
3.1	Coatings Interior Walls				
3.2.1	W2- 0.15x0.15m white ceramic tiles till 2.10m height	m2	200.87	20.0	4,017.40
3.2	Coatings Interior Flooring				
3.2.1	F2- 0.30x0.30m Porcelanic tiles,Anti-split, Grey colored	m2	46.17	20.0	923.40
3.2.2	F2- Baseboard	m/l			
3.2.3	F3- 0.60x0.60m Porcelanic tiles, Grey colored	m2	10.05	20.0	201.0
3.2.4	F3- Baseboard	m/l	17.94	6.0	107.64
3.2.5	F4- 0.60x0.60m Porcelanic tiles, Grey colored	m2	27.1	20.0	542.0
3.2.6	F4- Baseboard	m/l	n.a	6.0	
3.2.7	F5-0.60x0.60m Porcelanic tiles,Yellow colored	m2	n.a	20.0	
3.2.8	F5- Baseboard	m/l	n.a	6.0	

Continuation of chapter C

3	COATINGS				
3.2	Coatings Interior Flooring				
3.2.9	F6-0.60x0.60m Porcelanic tiles, Purple colored	m2	n.a	20.0	
3.2.10	F6- Baseboard	m/l	n.a	6.0	
3.2.11	F7-0.60x0.60m Porcelanic tiles, Blue colored	m2	329.67	22.0	7,252.74
3.2.12	F7- Baseboard	m/l	35.96	6.0	215.76
3.2.13	F8-0.60x0.60m Porcelanic tiles, Blue colored	m2	531.08	22.0	11,683.76
3.2.14	F8- Baseboard	m/l	508.45	6.0	3,050.70
4	CEILINGS				
4.1	Interior Ceilings				
4.1.1	Supply and execution of false interior ceiling: waterproofing plasterboard to be painted with paint (W1) including transport, unloading, support structure, backstrips, bars and reinforcements, relapses, opening of negatives for lighting, all complementary materials, works and accessories	m2	437.14	15.0	6,557.10
5	INTERIOR PAVING				
5.1	Floor levelling with screed levelling before the applyance of new coatings	a.w	1	500.0	500.0
6	PAINTINGS				
6.1	Exterior Paintings				
6.1.1	E2- "terracota" acrylic paint (RAL colour 2013)	m2	441.07	4.0	1,764.28
6.1.2	E3 -"concrete grey" acrylic paint (RAL colour 7023)	m2	226.76	4.0	907.04
6.1.3	E4-"pure white" poliuretane paint for metalic structure (RAL colour 9010)	m2	90.20	4.0	360.80
6.2	Interior Paintings				
6.2.1	W1-Washable acrylic white paint	m2	2121.72	4.0	8,486.88

AGENZIA ITALIANA PER LA COOPERAZIONE ALLO SVILUPPO

7	WOODWORK				
7.1	A1:MDF 20mm WITH HPL; 3,40 x 0,70 x 1,10m	un	1	1,000.0	1,000.0
7.2	A2:MDF 20mm WITH HPL; 1,20 x 0,70 x 1,10m	un	1	480.0	480.0
7.3	A3:MDF 20mm WITH HPL; 1,10 x 0,70 x 1,10m)+(2,50 x 0,70 x 1,10m)	un	1	1,800.0	1,800.0
7.4	A4:MDF 20mm WITH HPL; 2,10 x 0,70 x 1,10m	un	n.a	800.0	
7.5	A5: MDF 20mm WITH HPL; 2,55 x 0,70 x 1,10m	un	n.a	900.0	
7.6	B1: MDF 20mm WITH HPL ;1,65 x 0,60 x 0,90m	un	n.a	600.0	
7.7	B1': MDF 20mm WITH HPL; 1,65 x 0,35 x 0,60m	un	n.a	300.0	
7.8	B2: MDF 20mm WITH HPL; 2,15 x 0,60 x 0,90m	un	1	750.0	750.0
7.9	A3':MDF 20mm WITH HPL; 2,5 x 0,70 x 1,10m)+(1,10 x 0,70 x 1,10m)	un	1	1,800.0	1,800.0

Continuation of chapter C

7	WOODWORK				
7.10	B2': MDF 20mm WITH HPL; 2,15 x 0,35 x 0,60m	un	1	350.0	350.0
7.11	B3: MDF 20mm WITH HPL; 1,90 x 0,60 x 0,90m	un	1	700.0	700.0
7.12	B3':MDF 20mm WITH HPL; 1,90 x 0,35 x 0,60m	un	1	300.0	300.0
7.13	B4: MDF 20mm WITH HPL; 2,55 x 0,60 x 0,90m	un	n.a	900.0	
7.14	B4': MDF 20mm WITH HPL;2,55 x 0,35 x 0,60m	un	n.a	400.0	
7.15	B5: MDF 20mm WITH HPL; 1.80 x 0,60 x 0,90m	un	n.a	700.0	
7.16	B6: MDF 20mm WITH HPL; 1.50 x 0,60 x 0,90m	un	n.a	600.0	
7.17	C1: MDF 30mm WITH HPL; 1,65 x 0,60 x 0,75m	un	1	400.0	400.0
7.18	C2: MDF 30mm WITH HPL; 1,70 x 0,60 x 0,75m	un	1	400.0	400.0
7.19	C3: MDF 30mm WITH HPL; 2,20 x 0,60 x 0,75m	un	1	500.0	500.0
7.20	C4:MDF 30mm WITH HPL; 2,40 x 0,60 x 0,75m	un	1	550.0	550.0
7.21	C5: MDF 30mm WITH HPL;2,10 x 0,60 x 0,75m	un		500.0	-
7.22	C6: MDF 30mm WITH HPL;1,90 x 0,60 x 0,75m	un	1	450.0	450.0
7.23	D1: MDF 50mm WITH HPL;4,95 x 0,70 x 0,75m	un	1	950.0	950.0
7.24	D2: MDF 50mm WITH HPL;1,70 x 0,70 x 0,75m	un	1	350.0	350.0
8	DOORS				
8.1	Exterior Doors				
8.1.1	**G.1**- Double swing gate with fixed lateral sashes / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047" (dim. 4,22x2,10m). All accessories included.	un	1	850.0	850.0
8.1.2	**G.2**- Double swing gate with fixed lateral sashes / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047" (dim. 2,40x2,10m). All accessories included.	un	n.a	600.0	
8.1.3	**G.3**- Single swing gate with 1 fixed lateral sash / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 1,62x2,10m). All accessories included.	un	n.a	500.0	
8.1.4	**G.4**- Double swing gate / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 1,65x2,10m). All accessories included.	un	n.a	550.0	
8.1.5	**G.5**- Double swing gate with fixed lateral sashes / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 3,54x2,10m). All accessories included.	un	n.a	750.0	
8.1.6	**G.6**- Single swing gate with 1 fixed lateral sash / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 2,00x2,10m). All accessories included.	un	n.a	550.0	
8.1.7	**G.6**- Single swing gate with 1 fixed lateral sash / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 1,50x2,10m). All accessories included.	un	n.a	500.0	
8.2	Interior Doors				
8.2.1	**D.1**- Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,70x2,10m). Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,000.0	
8.2.2	**D.2**- Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,80x2,10m). Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	4	1,000.0	4,000.0
8.2.3	**D.3**- Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,90x2,10m). Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	24	1,000.0	24,000.0
8.2.4	**D.4**- Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,80x2,70m). Upper transom with a boom hung sash / 5+ 5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,200.0	
8.2.5	**D.5**- Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,85x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,200.0	
8.2.6	**D.6**- Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 1,00x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,200.0	

8.2.7	**D.7**- Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 1,10x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,250.0	
8.2.8	**D.8**- Double swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 1,60x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Panic bar in stainless steel. All accessories included.	un	3	1,500.0	4,500.0
8.2.9	**D.9**- Hermec sliding door / Hermetic system class 4, according UNI EN 12207 "Grupsa HS-201" / sheet of stainless steel (dim. 1,40x2,10m). No handle, automatic opening system. All accessories included.	un	4	1,400.0	5,600.0
8.2.10	**D.10**- Single swing door / MDF or plywood / thermal laminate HPL "light grey RAL 7047" with a kick board in stainless steel (dim. 1,00x3,10m). Upper transom with a fixed sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	5	1,500.0	7,500.0
8.2.11	**D.11**- Double swing door / MDF or plywood / thermal laminate HPL "light grey RAL 7047" with a kick board in stainless (dim. 1,50x3,10m). Upper transom with a fixed sash / 5+ 5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,900.0	
8.2.12	**D.11**- Double swing door / MDF or plywood / thermal laminate HPL "light grey RAL 7047" with a kick board in stainless (dim. 1,60x3,10m). Upper transom with a fixed sash / 5+ 5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	3	1,900.0	5,700.0

Continuation of chapter C

8.3	Technical cabinets				
8.3.1	**TC.1**- Technical cabinet with double swing door / MDF or plywood / thermal laminate HPL white " RAL 9010" (dim. 1,20x2,10). With key / no handle. All accessories included.	un	7	700.0	4,900.0
8.3.2	**TC.2**- Technical cabinet with double swing door / Galvenized steel/ painted "light grey RAL 7047" (dim. 1,20x2,10). With key / no handle. All accessories included.	un	n.a	500.0	
8.3.3	**TC.3**- Technical cabinet with single door / MDF or plywood/ thermal laminate HPL "white RAL 9010" (dim. 0,60x2,10). With key / no handle. All accessories included.	un	n.a	350.0	
8.3.4	**TC.4**- Technical cabinet with double swing door / Galvenized steel/ painted "light grey RAL 7047" (dim. 1,60x2,10). With key / no handle. All accessories included.	un	n.a	700.0	
8.3.5	**TC.5**- Technical cabinet with double swing door /MDF or plywood/thermolaminated "RAL 9010"	un	1	800.0	800.0
9	WINDOWS				
9.1	Interior Windows				
9.1.1	**W.1**- Slide and fixed window sashes / Anodized aluminium / Laminated 5+ 5mm clear glass (dim. 3,00x1,20). All accessories included.	un	n.a	450.0	
9.1.2	**W.2**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 2,25x1,50m). All accessories included.	un	n.a	420.0	
9.1.3	**W.3**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,00x1,40m). All accessories included.	un	n.a	175.0	
9.1.4	**W.4**- Boom hung window sash / Anodized aluminium / Laminated 5+5mm clear glass (dim. 0,60x1,50m). All accessories included.	un	n.a	115.0	
9.1.5	**W.5**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,50x2,00m). All accessories included.	un	n.a	375.0	
9.1.6	**W.6**- Boom hung window sash / Anodized aluminium / Laminated 5+5mm clear glass (dim. 0,75x1,50m). All accessories included.	un	1	140.0	140.0
9.1.7	**W.7**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,50x1,50m). All accessories included.	un	7	280.0	1,960.0
9.1.8	**W.8**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,50x1,50m). All accessories included.	un	9	280.0	2,520.0
9.1.9	**W.9**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,00x1,30m). All accessories included.	un	n.a	160.0	
9.1.10	**W.10**- Fixed interior window / Anodized aluminium frame / Laminated 5+5mm clear glass (dim. 1,20x1,10m). All accessories included.	un	1	165.0	165.0
9.1.11	**W.11**- Fixed interior window / Anodized aluminium frame / Laminated 5+5mm clear glass (dim. 2,20x1,10m). All accessories included.	un	3	300.0	900.0
9.2	Shadding				
9.2.1	**S.1**- Existing shutters to be relocated in the west and south exposed windows (dim. 1,50x1,20m). All accessories included.	un	4	225.0	900.0
9.3	Window Sill				
9.3.1	Existing Pre-fabricated concrete window sill (same width as the window) to be relocated	un	1	50.0	50.0
10	CANOPY				
10.1	Sandwich Roof Panels				
10.1.1	5 Ribs profiled outer sheet, exterior coating in white paint with good UV resistance (RAL 9010), core in Mineral wool with 80 mm thickness , interior coating: polymer coating resistant to mould (RAL 9010), Fire performance according to TS EN 13501-1,A2-s1	m2	110.47	50.0	5,523.50
10.2	Downspouts				
10.2.1	Metal downspouts painted in white with good UV resistance (RAL 9010) all joints and connections included	m/l	28.8	5.0	144.0
10.3	Gutters				
10.3.1	White Aluminium gutters, all joints included. Cover of the gutter with a lacquered (RAL 9010) metalic sheet with 48 cm high (please see detail on A,05,02 Walls and Gutters) held in place with metal clamps.	m/l	41.98	8.0	335.84

Continuation of chapter C

11	VARIOUS				
11.1	Supply and placement of break-proof mirrors placed complanarly with the tile, including transportation, discharge, fixing accessories, tapes and all materials and complementary accessories. Mirror: 1,2m height with variable lenght	m2	5.34	60.0	320.40
CHAPTER D - INSTALATION AND EQUIPMENT OF WATER AND SEWAGE SYSTEM					
1.	SANITARY EQUIPMENT				
1.1	Supply and laying of ceramic sanitary ware white glazed including transport, unloading, fastenings and connections, seals and all complementary materials, works and accessories	a.w	1	500.0	500.0
1.2	Toilets	un	3	500.0	1,500.0
1.3	Disabled Toilets	un	n.a	1,000.0	
1.4	Disabled Toilets Bars kits	un	n.a	500.0	
1.5	Squating Toilet	un	n.a	500.0	
1.6	Basin white glazed. dimensions: 45*35	un	n.a	350.0	
1.7	Basin white glazed. dimensions: 60*45	un	5	350.0	1,750.0
1.8	Shower Kit	un	3	300.0	900.0
1.9	Drain	un	3	50.0	150.0
1.10	Foot washing bathtub	un	n.a	100.0	
1.11	Kitchen Sink	un	n.a	300.0	
1.12	Scrub Basin in stainless steel	un	4	2,000.0	8,000.0
1.13	CSSD Basin	un	4	2,500.0	10,000.0
1.14	Soiled Tray	un	3	100.0	300.0
CHAPTER E - LANDSCAPING					
10.1	Paving				
10.1.1	EF1-Resistent concrete pieces above a compacted pavement (vehicle road)	m2	n.a	35.0	
10.1.2	EF2-Concrete pieces (pedestrian sidewalk)	m2	n.a	35.0	
10.1.3	EF3-Compacted gravel	m2	n.a	8.0	
10.1.4	EF4-Earth and humus to plant resistant type grass	m2	n.a	3.0	

Continuation of chapter E

10.1.5	Smoothed concrete floor with a siloxane sealer (exterior corridor)	m2		35.0	-
10.2	Forestation				
10.2.1	New trees (local species to be defined)	un		100.0	-
10.2.1	New bushes (local species to be defined)	m/l		30.0	-
	Total for PACK 2-ARC				194,557.5

End of BoQ_Saudy Maternity Hospital_ 31 January 2020

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Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
3	**STRUCTURES**					
3.1	**BLOCK E**					**31,461.59 €**
3.1.1	**EARTH-WORKS**					
3.1.1.1	**Excavation**					
3.1.1.1.1	Excavation on land of any nature in order to obtain project levels, including loading and transport of surplus material to the dump, eventual bracing, pumping of the tributary water to the excavation, regularization of the bottom of the box and replacement of land whenever necessary, all executed in order to obtain the levels indicated in the design.	m3	56.5	6.00 €	338.81 €	
3.1.1.2	**Excavation for foundations**					
3.1.1.1.2	Excavation on land of any nature for the implementation of foundations elements, including loading and transport of surplus material to the dump, eventual bracing, pumping of the tributary water to the excavation, regularization of the bottom of the box and replacement of land whenever necessary, all executed in order to obtain the levels indicated in the design.	m3	89.3	6.00 €	535.86 €	
3.1.2	**CONCRETE**					
3.1.2.1	**Blinding concrete**					
3.1.2.1.1	Concrete C16/20, for regularization of foudations, including supply, transport, placement, compaction and curing, according to the design.	m3	2.0	130.00 €	254.15 €	
3.1.2.1.2	Concrete C16/20, for foundation well, including supply, transport, placement, compaction and curing, according to the design. Note: For the quantification of the concrete in foundation pits (and the respective excavation) it was considered that the soil with the appropriate characteristics to support the projected structures is 3m deep, measured in relation to the level of the pavement. This assumption must be verified on site.	m3	62.5	130.00 €	8,127.21 €	
3.1.3	**REINFORCED CONCRETE**					
3.1.3.1	**Foundations**					
3.1.3.1.1	Reinforced concrete in Footing Standard grey concrete C25/30, including supply, transport, placement, compaction, curing and incorporation of water-repellent, according to the design. Reinforcement in A500 steel, including supply, transport, folding, cutting, assembly, anchorages, splicing, scrap and laying, according to the design. Formwork for concrete, in metal or wood molds, without defects, including transport, shoring, oil extraction and subsequent disassembly, according to the design.	m3	6.7	280.00 €	1,876.00 €	
3.1.3.1.2	Reinforced concrete in Locking Beams Standard grey concrete C25/30, including supply, transport, placement, compaction, curing and incorporation of water-repellent, according to the design. Reinforcement in A500 steel, including supply, transport, folding, cutting, assembly, anchorages, splicing, scrap and laying, according to the design. Formwork for concrete, in metal or wood molds, without defects, including transport, shoring, oil extraction and subsequent disassembly, according to the design.	m3	9.8	350.00 €	3,421.25 €	
3.1.3.1.3	Reinforced concrete in Plinths Standard grey concrete C25/30, including supply, transport, placement, compaction, curing and incorporation of water-repellent, according to the design. Reinforcement in A500 steel, including supply, transport, folding, cutting, assembly, anchorages, splicing, scrap and laying, according to the design. Formwork for concrete, in metal or wood molds, without defects, including transport, shoring, oil extraction and subsequent disassembly, according to the design.	m3	1.4	380.00 €	516.80 €	
3.1.4	**OTHER SLABS**					
3.1.4.1	Ground Floor Slab Ground floor consisting of a concrete slab C25/30, 0,15m thick, including surface hardener, top and bottom welded reinforcement mesh, PVC membrane with 0,12mm thick, concrete slab C16/20, 0.05m thick, crushed material densely packed with 0.30m thickness, regularization and compacting of the existing ground, supply, transport, laying and all the necessary complementary work, all executed according to the design.	m2	87.8	52.00 €	4,565.60 €	

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
3	**STRUCTURES**					
3.1.5	**WATERPROOFING**					
3.1.5.1	Waterproofing type system Impermeability of the elements buried in contact with the ground, with application of bituminous paint in two coats, including supply, transport and placement, folds, overlaps, finishes and losses, all executed according to the project	m2	134.3	12.00 €	1,611.72 €	
3.1.6	**STEEL STRUCTURE**					
3.1.6.1	Structure in Steel Profiles Steel structure in S275 JR/JRH resistance steel profiles, including in the unit price the cost of the following works: supply, transport, assembly, welding and / or screw connections, plates, reinforcements, supports, waste, anchors, screws, nut, washers , connectors, bars, anchors, welds, holes, chemical sealing, mortar, scraping, anti-corrosion and any additional work required, according to the project.					
3.1.6.1.1	IPE 270	kg	1,361.0	1.50 €	2,041.46 €	
3.1.6.1.2	IPE 240	kg	1,151.3	1.50 €	1,726.88 €	
3.1.6.1.3	IPE 140	kg	881.1	1.50 €	1,321.61 €	
3.1.6.1.4	L50x50x4	kg	66.1	1.50 €	99.14 €	
3.1.6.1.5	CHS 200x8	kg	250.1	1.50 €	375.21 €	
3.1.6.1.6	CHS 200x5	kg	1,218.0	1.50 €	1,827.00 €	
3.1.6.1.7	CHS 114,3x4	kg	491.6	1.50 €	737.39 €	
3.1.6.1.8	SHS 50x50x4	kg	667.4	1.50 €	1,001.07 €	
3.1.6.1.9	Rod Φ 12mm	kg	56.3	1.50 €	84.45 €	
3.1.6.2	Execution of fire protection in steel profiles (article 3.1.6.1) including in the unit price the cost of the following works: surface preparation, intumiscent painting with fire resistance up to 60 minutes and any additional work required, according to the project.	gv	1.0	1,000.00 €	1,000.00 €	
	Important Notes: 1) The measures to determine quantities relating earth-works, were obtained from the geometric shapes defined in the design. No blistering, overcrowing, slopes or work platforms were considered. These costs should be included in the unit price of the excavation presented by the contractor. 2) Prior the start of the excavation, the contractor must certify whether or not plant network, such as water, sanition, gas, electrical and telephone installations and provision of their protection or diversion, must be reflected in the unit price of the excavation presented by the contractor. 3) The measures to determinate the quantities of reinfoced concrete were obtained from geometric shapes defined in the design. 4) The measuremente of steel does not consider anchorages, overlays, hooks, scrap and accessories. These costs must be included in the unit price per kg submitted by the contractor. 5) In order to obtain all the charecteristics of the materials, including concrete and steel, should be consulted the drawing of Table Frame of Materials and General Notes.					

Original

REHABILITATION OF THE SAUDI MATERNITY HOSPITAL
KASSALA HEALTH CITADEL - SUDAN
BOQ - BILL OF QUANTITY
Package 2 (Block E)

CODE	DISCIPLINE	VALUE
4	WATER SUPPLY SYSTEM	5,007.85 €
5	WASTEWATER DRAINAGE SYSTEM	14,410.00 €
6	STORMWATER DRAINAGE SYSTEM	6,966.00 €
7	FIREFIGHTING WATER SYSTEM	16,274.70 €
TOTAL		**42,658.55 €**

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
4.	**WATER SUPPLY SYSTEM**					
4.1	**Package 2 (Block E)**					**5,007.85 €**
4.1.1	**Pipping**					
4.1.1.1	Supply and installation of PP-R Pipes for the water supply netwotk, with thermal insulation in hot water, including all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.1.1.1	Cold Water:					
4.1.1.1.1.1	Ø 16 mm	m	19.80	3.00 €	59.40 €	
4.1.1.1.1.2	Ø 20 mm	m	45.20	3.00 €	135.60 €	
4.1.1.1.1.3	Ø 25 mm	m	49.40	3.50 €	172.90 €	
4.1.1.1.1.4	Ø 32 mm	m	50.10	3.50 €	175.35 €	
4.1.1.1.1.5	Ø 40 mm	m	28.80	10.00 €	288.00 €	
4.1.1.1.2	Hot Water:					
4.1.1.1.2.1	Ø 20 mm	m	35.00	3.00 €	105.00 €	
4.1.1.1.2.2	Ø 25 mm	m	2.00	3.50 €	7.00 €	
4.1.1.2	Supply and installation of HDPE pipeor the water supply network, buried, including earthworks and installation, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.1.2.1	Cold Water:					
4.1.1.2.1.1	Ø 40 mm	m	5.60	3.50 €	19.60 €	
4.1.2	**Equipment and Accessories**					
4.1.2.1	Supply and installation of angles Valves, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following equipments:					
	Wash Basin					
	- In cold water:	un	9	6.00 €	54.00 €	
	WC Cistern					
	- In cold water:	un	3	6.00 €	18.00 €	
4.1.2.2	Supply and installation of Valves, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.2.2.1	Ø 20 mm	un	7	7.00 €	49.00 €	
4.1.2.2.2	Ø 25 mm	un	8	7.00 €	56.00 €	
4.1.2.2.3	Ø 32 mm	un	2	9.00 €	18.00 €	
4.1.2.2.4	Ø 50 mm	un	1	10.00 €	10.00 €	
4.1.2.3	Supply and installation of shut-off buried Valves, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.2.3.1	Ø 40 mm	un	2	120.00 €	240.00 €	
4.1.2.4	Supply and installation of eletrical heaters with acumulation tank, includind shut-off valves, retention valves, electrical connection work, and all accessories, and all works and materials and accessories necessary to a correct execution of the task, with the following capacities:					
4.1.2.4.1	50L horizontal	un	1	250.00 €	250.00 €	
4.1.2.4.2	100L horizontal	un	1	350.00 €	350.00 €	
4.1.3	**Complementary Work**					
4.1.3.1	Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	1,000.00 €	1,000.00 €	
4.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	500.00 €	500.00 €	
4.1.4	**Final Work**					
4.1.4.1	Verification, cleaning and testing of all network.	gv	1	1,000.00 €	1,000.00 €	
4.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	500.00 €	500.00 €	

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
5.	**WASTEWATER DRAINAGE SYSTEM**					
5.1	**Package 2 (Block E)**					**14,410.00 €**
5.1.1	**Pipping**					
5.1.1.1	Supply and installation of PVC pipes for buried/embedded wastewater drainage network (inside building), installed in proper ditches, as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans and construction supervision instructions, with the following diameters:					
5.1.1.1.1	Ø 40 mm	m	46.00	4.00 €	184.00 €	
5.1.1.1.2	Ø 75 mm	m	51.00	6.00 €	306.00 €	
5.1.1.1.3	Ø 90 mm	m	34.00	10.00 €	340.00 €	
5.1.1.2	Supply and installation of PVC pipes for buried/embedded wastewater drainage network (outside building), installed in proper ditches, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans and construction supervision instructions, with the following diameters:					
5.1.1.2.1	Ø 110 mm	m	55.00	10.00 €	550.00 €	
5.1.2	**Equipment and Accessories**					
5.1.2.1	Supply and installation of siphon, as well as all the works, materials and accessories necessary to the correct execution of the task, to install on the following equipments:					
5.1.2.1.1	Wash Basin	un	16	250.00 €	4,000.00 €	
5.1.2.1.2	Turkish Toilet	un	3	350.00 €	1,050.00 €	
5.1.2.1.3	Shower	un	3	250.00 €	750.00 €	
5.1.2.2	Supply and installation of traps in chrome plated brass, as well as all the works, materials and accessories necessary to the correct execution of the task.	un	11	20.00 €	220.00 €	
5.1.2.3	Supply and installation of ventilation hats, to be installed on the roof, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
5.1.2.3.1	Ø 90 mm	un	3	20.00 €	60.00 €	
5.1.2.4	Execution of a concrete manholes supported by a suitable recessed cast iron covers, load class B125 to receive the same finishing of the floor, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans, detail drawings and construction supervision instructions, with the following dimensions:					
5.1.2.4.1	0.60x0.60	un	7	250.00 €	1,750.00 €	
5.1.2.4.2	0.80x0.80	un	3	300.00 €	900.00 €	
5.1.3	**Complementary Work**					
5.1.3.1	Construction work to support the implementation of wastewater networks, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	1,000.00 €	1,000.00 €	
5.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	800.00 €	800.00 €	
5.1.3.3	Evaluation, rehabilitation (if necessary), cleaning and maintenance works of existing networks to be maintained, including all materials and work necessary for their perfect execution.	gv	1	1,000.00 €	1,000.00 €	
5.1.4	**Final Work**					
5.1.4.1	Verification and testing of all network.	gv	1	500.00 €	500.00 €	
5.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	1,000.00 €	1,000.00 €	

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
6.	**STORMWATER DRAINAGE SYSTEM**					
6.1	**Package 2 (Block E)**					**6,966.00 €**
6.1.1	**Pipping**					
6.1.1.1	Supply and installation of PVC pipes for vertical rainwater drainage network, embedded/at sight, as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans and construction supervision instructions, with the following diameters:					
6.1.1.1.1	Ø 160 mm	m	8.00	15.00 €	120.00 €	
6.1.1.1.2	Ø 200 mm	m	11.00	16.00 €	176.00 €	
6.1.1.2	Supply and installation of PVC pipes for buried/embedded rainwater drainage network, installed in proper ditches, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the					
6.1.1.2.1	Ø 160 mm	m	22.00	15.00 €	330.00 €	
6.1.1.2.2	Ø 250 mm	m	47.00	20.00 €	940.00 €	
6.1.2	**Equipment and Accessories**					
6.1.2.1	Execution of a concrete manholes supported by a suitable gully cast iron covers, load class B125 to receive the same finishing of the floor, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans, detail drawings and construction supervision instructions, with the following					
6.1.2.1.1	0.40x0.40	un	2	250.00 €	500.00 €	
6.1.2.2	Execution of a concrete manholes supported by a suitable recessed cast iron covers, load class B125 to receive the same finishing of the floor, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans, detail drawings and construction supervision instructions, with the following dimensions:					
6.1.2.2.1	1.00x1.00	un	4	350.00 €	1,400.00 €	
6.1.3	**Complementary Work**					
6.1.3.1	Construction work to support the implementation of wastewater networks, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	1,000.00 €	1,000.00 €	
6.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	500.00 €	500.00 €	
6.1.3.3	Evaluation, rehabilitation (if necessary), cleaning and maintenance works of existing networks to be maintained, including all materials and work necessary for their perfect execution.	gv	1	1,000.00 €	1,000.00 €	
6.1.4	**Final Work**					
6.1.4.1	Verification and testing of all network.	gv	1	500.00 €	500.00 €	
6.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	500.00 €	500.00 €	

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
7.	**FIREFIGHTING WATER SYSTEM**					**16,274.70 €**
7.1	**Package 2 (Block E)**					**16,274.70 €**
7.1.1	**Pipping**					
7.1.1.1	Supply and installation of HDPE pipe, for Firefighting network, buried, including earthworks and installation, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
7.1.1.1.1	Ø 50 mm	m	5.20	20.00 €	104.00 €	
7.1.1.1.2	Ø 75 mm	m	13.50	33.60 €	453.60 €	
7.1.1.1.3	Ø 90 mm	m	7.80	42.00 €	327.60 €	
7.1.1.2	Supply and Installation of Galvanized steel pipe, for the Firefighting network, including bonding and branch accessories, supports and clamps with acoustic insulation, threaded or grooved, installed at sight, fixed by quick-mount clamps in galvanized iron attached to walls or ceilings, including opening and closure of notches, wall/floor/ceilings holes for pipe crossings, a first coat of painting anticorrosive, and two coats of colour finishing according legal standards, and remaining accessories necessary to the good functioning of the network, according the plans and construction supervision instruction, with the following diameters:					
7.1.1.2.1	Ø 50 mm	m	94.40	25.00 €	2,360.00 €	
7.1.1.2.2	Ø 65 mm	m	1.70	35.00 €	59.50 €	
7.1.2	**Equipment and Accessories**					
7.1.2.1	Supply and installation of Swing type fire hosereel, Model 99-N(19mm), to be installed in a closet with 180° opening door, predicted by the architecture, with reinforced PVC hose, with 30m length, 3 position nozzle: jet, fog and closure, including manual quick-release valve with manometer, axial bracket, tested and approved according EN 671-1:2012, remaining accessories and necessary works for a perfect execution of the task according construction supervision instructions.	un	6	720.00 €	4,320.00 €	
7.1.3	**Complementary Work**					
7.1.3.1	Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	2,800.00 €	2,800.00 €	
7.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	3,000.00 €	3,000.00 €	
7.1.4	**Final Work**					
7.1.4.1	Verification, cleaning and testing of all network.	gv	1	1,500.00 €	1,500.00 €	
7.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	1,350.00 €	1,350.00 €	

AGENZIA ITALIANA PER LA COOPERAZIONE ALLO SVILUPPO

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
	8 ELECTRICAL INSTALLATIONS					
8.1	**BLOCK E**					**71,308.50 €**
	The Bill of Quantities, Specifications, Drawings and all other Contract documents are complementary to each other. **It is the responsibility of the Contractor to check the locations and quantities of the materials and equipment to be executed in accordance with the drawings.** **The unit rate of the materials and equipment shall be based on the Specification, all components as required and specified under each item concerned in the Specifications, Drawings, and all other Contract documents.**					
8.1.1	**Low Voltage Switchboard**					
8.1.1.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.1.2	Normal / Standby Switchboards:					
8.1.1.2.1	- S.E.0 (E)	Un	1	300.00 €	300.00 €	
8.1.1.2.2	- S.E.1 (E)	Un	1	250.00 €	250.00 €	
8.1.1.3	Uninterrupted Switchboards:	Un				
8.1.1.3.1	- S.E.PR (IT)	Un	1	250.00 €	250.00 €	
8.1.1.3.2	- S.E.OR.1 (IT)	Un	1	250.00 €	250.00 €	
8.1.1.3.3	- S.E.OR.2 (IT)	Un	1	250.00 €	250.00 €	
8.1.1.3.4	- S.E.OR.3 (IT)	Un	1	250.00 €	250.00 €	
8.1.1.3.5	- S.E.OR.4 (IT)	Un	1	250.00 €	250.00 €	
8.1.1.4	Tertiary Power Supply					
8.1.1.4.1	- UPS System with a rated power of the 8kVA 1/1 (60min Autonomy), single-phase, on-line double conversion architecture, run through the Inverter, VFI.	Un	5	4,500.00 €	22,500.00 €	
8.1.1.5	Safety Isolating Transformers - Medical IT Systems:					
8.1.1.5.1	- Dry type isolation transformers, 230 V / 230 V, IP23, 5KVA equipped with thermal sensors and load supervisor, complete with all necessary accessories.	Un	5	2,500.00 €	12,500.00 €	
8.1.1.5.3	- Permanent electrical insulating monitors	Un	5	500.00 €	2,500.00 €	
8.1.1.5.4	- Permanent electrical insulating repeaters	Un	5	400.00 €	2,000.00 €	
8.1.2	**Cabling**					
8.1.2.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.2.2	LV Distribution Cables (Indoor):					
8.1.2.2.1	- 5G16 mm² Cu/ XLPE/ PVC	ml	27	18.00 €	486.00 €	
8.1.2.2.2	- 3G16 mm² Cu/ XLPE/ PVC	ml	118	17.00 €	2,006.00 €	
8.1.2.2.3	- 5G10 mm² Cu/ XLPE/ PVC	ml	34	15.00 €	510.00 €	
8.1.3	**Lighting**					
8.1.3.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.3.2	Indoor Lighting:					
8.1.3.2.1	Luminaires:					
8.1.3.2.1.1	- L1	Un	2	20.00 €	40.00 €	
8.1.3.2.1.2	- L3.1	Un	7	20.00 €	140.00 €	
8.1.3.2.1.3	- L3.2	Un	11	22.00 €	242.00 €	
8.1.3.2.1.4	- L4.1	Un	2	40.00 €	80.00 €	
8.1.3.2.1.5	- L5	Un	40	50.00 €	2,000.00 €	
8.1.3.2.1.6	- L6	Un	14	50.00 €	700.00 €	
8.1.3.2.1.7	- L6R	Un	5	60.00 €	300.00 €	
8.1.3.2.1.8	- L9.0	Un	1	40.00 €	40.00 €	
8.1.3.2.1.9	- L9.1	Un	13	50.00 €	650.00 €	
8.1.3.2.1.10	- L11	Un	3	50.00 €	150.00 €	
8.1.3.2.1.11	- L12	Un	1	40.00 €	40.00 €	
8.1.3.2.1.12	- L14.2	Un	6	20.00 €	120.00 €	
8.1.3.2.1.13	- L18.1	Un	2	20.00 €	40.00 €	
8.1.3.2.1.14	- L18.2	Un	5	22.00 €	110.00 €	
8.1.3.2.1.15	- L18.3	Un	1	25.00 €	25.00 €	
8.1.3.3	Lighting Command Devices					
8.1.3.3.1	- One way switch, surface mounting	Un	22	15.00 €	330.00 €	
8.1.3.3.2	- Double pole switch, surface mounting	Un	2	15.00 €	30.00 €	
8.1.3.3.3	- Two way switch, single pole, surface mounting	Un	3	15.00 €	45.00 €	
8.1.3.3.4	- Dimmer switch (light flux regulator 0-10V)	Un	2	15.00 €	30.00 €	
8.1.3.3.5	- Surface Mounting Movement Detector 360°	Un	9	20.00 €	180.00 €	
8.1.3.4	Flush and surface Mounting Boxes:					
8.1.3.4.1	- Surface or Recessed mounting Connection Box	Un	45	2.00 €	90.00 €	
8.1.3.5	Electrical cables:					
8.1.3.5.1	Enclosed in a recessed or surface conduiting:					
8.1.3.5.1.1	- 2x 1.5 mm² Cu/ XLPE/ LSZH	ml	162	1.50 €	243.00 €	
8.1.3.5.1.2	- 3x 1.5 mm² Cu/ XLPE/ LSZH	ml	20	2.00 €	40.00 €	
8.1.3.5.1.3	- 3G 1.5 mm² Cu/ XLPE/ LSZH	ml	305	2.50 €	762.50 €	
8.1.3.5.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
8.1.3.5.2.1	- 3x 1.5 mm² Cu/ XLPE/ LSZH	ml	26	2.00 €	52.00 €	
8.1.3.5.2.2	- 3G 1.5 mm² Cu/ XLPE/ LSZH	ml	137	2.50 €	342.50 €	
8.1.3.6	Metric Rigid Conduit:					
8.1.3.6.1	Enclosed in a recessed or surface conduiting:					
8.1.3.6.1.1	- PEAD Ø 20 mm	ml	486	0.50 €	243.00 €	

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
	8 ELECTRICAL INSTALLATIONS					
8.1.4	**Emergency / Safety Lighting**					
8.1.4.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.4.2	Indoor Lighting:					
8.1.4.2.1	- S1 - maintained (60min Autonomy)	Un	9	50.00 €	450.00 €	
8.1.4.2.2	- S1 - not maintained (60min Autonomy)	Un	24	40.00 €	960.00 €	
8.1.4.2.3	- S2 - maintained (60min Autonomy)	Un	4	50.00 €	200.00 €	
8.1.4.3	Flush and surface Mounting Boxes:					
8.1.4.3.1	Surface or Recessed mounting Connection Box	Un	35	2.00 €	70.00 €	
8.1.4.4	Electrical cables:					
8.1.4.4.1	Enclosed in a recessed or surface conduiting:					
8.1.4.4.1.1	- 3G 1,5 mm² Cu/ XLPE/ LSZH	ml	99	2.00 €	198.00 €	
8.1.4.4.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
8.1.4.4.2.1	- 3G 1,5 mm² Cu/ XLPE/ LSZH	ml	69	2.00 €	138.00 €	
8.1.4.5	Metric Rigid Conduit:					
8.1.4.5.1	Enclosed in a recessed or surface conduiting:					
8.1.4.5.1.1	- PVC Ø 20 mm	ml	99	0.50 €	49.50 €	
8.1.5	**General Purpose Power Outlet**					
8.1.5.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.5.2	Single Flush and Surface Mounting Devices - Normal/Standby Supply:					
8.1.5.2.1	- Surface Mounting Earthed Socket (BS Type) - 16A with cover IP44	Un	10	15.00 €	150.00 €	
8.1.5.2.2	- Flush Mounting Earthed Socket (BS Type) - 16A trunking	Un	4	15.00 €	60.00 €	
8.1.5.2.3	- Surface mounting earth Socket (BS Type) - 16A IP44	Un	29	15.00 €	435.00 €	
8.1.5.2.4	- Surface mounting earth Socket (BS Type) - 3P+N+T 16A, splash-protected IP44, wiht cover	Un	4	20.00 €	80.00 €	
8.1.5.3	Double Flush and Surface Mounting Devices - Normal/Standby Supply:					
8.1.5.3.1	- Surface Mounting Earthed Socket (BS Type) - 16A IP44	Un	1	17.00 €	17.00 €	
8.1.5.3.2	- Flush Mounting Earthed Socket (BS Type) - 16A trunking	Un	18	17.00 €	306.00 €	
8.1.5.3.3	- Flush Mounting Earthed Socket (BS Type) - 16A head wall unit	Un	8	20.00 €	160.00 €	
8.1.5.4	Triple Flush and Surface Mounting Devices - Normal/Standby Supply:					
8.1.5.4.1	- Flush Mounting Earthed Socket (BS Type) - 16A head wall unit	Un	10	30.00 €	300.00 €	
8.1.5.5	Single Flush and Surface Mounting Devices - Uninterruptible Supply:					
8.1.5.5.1	- Flush Mounting Earthed Socket (BS Type) - 16A	Un	4	15.00 €	60.00 €	
8.1.5.6	Double Flush and Surface Mounting Devices - Uninterruptible Supply:					
8.1.5.6.1	- Surface Mounting Earthed Socket (BS Type) - 16A IP44	Un	8	17.00 €	136.00 €	
8.1.5.6.2	- Flush Mounting Earthed Socket (BS Type) - 16A head wall unit	Un	14	20.00 €	280.00 €	
8.1.5.7	Triple Flush and Surface Mounting Devices - Uninterruptible Supply:					
8.1.5.7.1	- Surface Mounting Earthed Socket (BS Type) - 16A IP44	Un	4	15.00 €	60.00 €	
8.1.5.8	Flush and surface Mounting Boxes:					
8.1.5.8.1	- Surface or Recessed mounting Connection Box	Un	61	2.00 €	122.00 €	
8.1.5.8.2	- Surface or Recessed mounting Terminal Box	Un	47	2.00 €	94.00 €	
8.1.5.9	Electrical cables:					
8.1.5.9.1	Enclosed in a recessed or surface conduiting:					
8.1.5.9.1.1	- 3G 2.5 mm² Cu/ XLPE/ LSZH	ml	1163	2.00 €	2.326.00 €	
8.1.5.9.1.2	- 5G 2.5 mm² Cu/ XLPE/ LSZH	ml	90	3.00 €	270.00 €	
8.1.5.9.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
8.1.5.9.2.1	- 3G 2.5 mm² Cu/ XLPE/ LSZH	ml	410	2.00 €	820.00 €	
8.1.5.9.2.2	- 5G 2.5 mm² Cu/ XLPE/ LSZH	ml	53	3.00 €	159.00 €	
8.1.5.10	Metric Rigid Conduit:					
8.1.5.10.1	Enclosed in a recessed or surface conduiting:					
8.1.5.10.1.1	- PVC Ø 20 mm	ml	1,163.00	0.50 €	581.50 €	
8.1.5.10.1.2	- PVC Ø 25 mm	ml	90	0.50 €	45.00 €	
8.1.6	**Cable tray, Trunking System and Conduits**					
8.1.6.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.6.2	Metalic perforated cable tray of side height 60 mm:					
8.1.6.2.1	Electrical Instalation:					
8.1.6.2.1.1	- 200 width, strip-galvanised	ml	85	20.00 €	1,700.00 €	
8.1.6.2.1.2	- 100 width, strip-galvanised	ml	17	15.00 €	255.00 €	
8.1.6.2.2	ICT Instalation:					
8.1.6.2.2.1	- 200 width, strip-galvanised	ml	42	20.00 €	840.00 €	
8.1.6.2.2.2	- 100 width, strip-galvanised	ml	21	15.00 €	315.00 €	
8.1.6.3	Distribution Cable-Trunkings:					
8.1.6.3.1	- Cable-Trunkings, with 110x50mm	ml	40	15.00 €	600.00 €	
8.1.6.4	Head wall unit: (complete with all the materials and accessories necessary to the correct execution of the task)					
8.1.6.4.1	- HW 2 - Recovery - 1.5m	Un	10	40.00 €	400.00 €	
8.1.6.4.2	- HW 3 - Operating Theater - 1m	Un	4	30.00 €	120.00 €	
8.1.6.4.3	- HW 4 - Nuci - 1m	Un	4	30.00 €	120.00 €	
8.1.6.5	Metric Rigid Conduit:					
8.1.6.5.1	Enclosed in a recessed or surface conduiting:					
8.1.6.5.1.1	- PVC Ø 25 mm	ml	129	0.50 €	64.50 €	
8.1.7	**Equipotentiality network**					
	- Equipotentiality network of the operating and recovery room, including equalizar panel, conection to the conductive floor and other condutive elements.	Gv	1	4,000.00 €	4,000.00 €	
8.1.8	**Complementary Work**					
8.1.8.1	- Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	Gv	1	1,000.00 €	1,000.00 €	
8.1.8.2	- Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and	Gv	1	1,000.00 €	1,000.00 €	
8.1.9	**Final Work**					
8.1.9.1	- Verification, cleaning and testing of all network.	Gv	1	500.00 €	500.00 €	
8.1.9.2	- Elaboration of the pieces drawn according to the work executed.	Gv	1	500.00 €	500.00 €	
	TOTAL ELECTRICAL INSTALLATIONS					**71,308.50 €**

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
9.	**INFORMATION & COMMUNICATIONS TECHNOLOGY (ITC)**					
9.1	**BLOCK E**					**26,890.92 €**
	The Bill of Quantities, Specifications, Drawings and all other Contract documents are complementary to each other. It is the responsibility of the Contractor to check the locations and quantities of the materials and equipment to be executed in accordance with the drawings. The unit rate of the materials and equipment shall be based on the Specification, all components as required and specified under each item concerned in the Specifications, Drawings, and all other Contract documents.					
9.1.1	**TCP/IP Network**					
9.1.1.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
9.1.1.1.1	Building Telecommunications Racks, Boxes and Cabinets:					
9.1.1.1.1.1	**- (Rack 2)**					
9.1.1.1.1.1.1	- Server Cabinet 33U's (Rack 19" A1700xL800xP800 [mm]	Un	1	1,170.00 €	1,170.00 €	
9.1.1.1.1.1.2	- Optical Fiber Panel 12 SC/APC connector (OF arrival)	Un	1	222.00 €	222.00 €	
9.1.1.1.1.1.3	- Painel Coaxial (RG-CC Mirror)	Un	1	150.00 €	150.00 €	
9.1.1.1.1.1.4	- Patch Panel 1HU 24 RJ45 Cat 6A connector. (Distribution)	Un	4	306.00 €	1,224.00 €	
9.1.1.1.1.1.5	- Outlet Rackmount Power Strip 220V with a breaker.	Un	1	105.60 €	105.60 €	
9.1.1.1.1.1.6	- Including, set of 2 fans with thermostat, Fixed Shelf, Cable Management, Rings, and all required accessories and equipments necessary for its perfect assembly and operation.	Un	1	162.00 €	162.00 €	
9.1.1.1.2	Flush and Surface Mounting Devices:					
9.1.1.1.2.1	- Data outlet 1xRJ45 CAT 6A - Surfaced assembly	Un	1	22.20 €	22.20 €	
9.1.1.1.2.2	- Data outlet 2xRJ45 CAT 6A - Surfaced assembly	Un	17	42.00 €	714.00 €	
9.1.1.1.2.3	- Data outlet 2xRJ45 CAT 6A - Trunkung System assembly	Un	7	49.56 €	346.92 €	
9.1.1.1.3	Electrical cables:					
9.1.1.1.3.1	Enclosed in a recessed or surface conduiting:					
9.1.1.1.3.1.1	- U/UTP Category 6A Copper LSZH	ml	310	1.32 €	409.20 €	
9.1.1.1.3.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
9.1.1.1.3.2.1	- U/UTP Cat 6 LSZH	ml	1500	1.92 €	2,880.00 €	
9.1.1.1.4	Patch cords:					
9.1.1.1.4.1	- U/UTP Category 6A Copper 1.0mt LSZH	Un	96	6.00 €	576.00 €	
9.1.1.1.4.2	- U/UTP Category 6A Copper 3mt LSZH	Un	96	9.60 €	921.60 €	
9.1.1.1.4.3	- FO 50/125 OM3 LSZH	Un	4	55.20 €	220.80 €	
9.1.1.1.5	Metric Rigid Conduit:					
9.1.1.1.5.1	Enclosed in a recessed or surface conduiting:					
9.1.1.1.5.1.1	- PVC Ø 25 mm	ml	300	0.96 €	288.00 €	
9.1.1.1.6	Others:					
9.1.1.1.6.1	- Engineering, System Programming, including System Testing, Commissioning and Training.	Gv	1	2,100.00 €	2,100.00 €	
9.1.1.1.6.2	- Connections, connectorizations and labeling.	Gv	1	816.00 €	816.00 €	
9.1.2	**TV Cabling**					
9.1.2.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
9.1.2.1.1	Flush and Surface Mounting Devices:					
9.1.2.1.1.1	- TV outlet single surface flush mounting	Un	1	54.00 €	54.00 €	
9.1.2.1.2	Electrical cables:					
9.1.2.1.2.1	Enclosed in a recessed or surface conduiting:					
9.1.2.1.2.1.1	- Coaxial cable T-100 PVC Class A 3GHz 16PRtC (Antenna)	ml	5	1.08 €	5.40 €	
9.1.2.1.2.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
9.1.2.1.2.2.1	- Coaxial cable T-100 PVC Class A 3GHz 16PRtC (Antenna)	ml	30	1.20 €	36.00 €	
9.1.2.1.3	Metric Rigid Conduit:					
9.1.2.1.3.1	Enclosed in a recessed or surface conduiting:					
9.1.2.1.3.1.1	- PVC Ø 25 mm	ml	3	0.72 €	2.16 €	
9.1.2.1.4	Others:					
9.1.2.1.4.1	- Engineering, System Programming, including System Testing, Commissioning and Training.	Gv	1	36.00 €	36.00 €	
9.1.2.1.4.2	- Connections, connectorizations and labeling.	Gv	1	19.20 €	19.20 €	
9.1.3	**Video Security System**					
9.1.3.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
9.1.3.1.1	Video Security System Devices:					
9.1.3.1.1.1	- Security Camera "Bullet" IP (POE) / Indoor	Un	1	774.00 €	774.00 €	
9.1.3.1.2	Electrical cables:					
9.1.3.1.2.1	Enclosed in a recessed or surface conduiting:					
9.1.3.1.2.1.1	- S/FTP 4 pair, CAT6A, LSZH, 250/23	ml	3	2.76 €	8.28 €	
9.1.3.1.2.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
9.1.3.1.2.2.1	- S/FTP 4 pair, CAT6A, LSZH, 250/23	ml	30	3.36 €	100.80 €	
9.1.3.1.3	Metric Rigid Conduit:					
9.1.3.1.3.1	Enclosed in a recessed or surface conduiting:					
9.1.3.1.3.1.1	- PVC Ø 20 mm	ml	2	0.78 €	1.56 €	
9.1.3.1.4	Others:					
9.1.3.1.4.1	- Engineering, System Programming, including System Testing, Commissioning and Training.	Gv	1	192.00 €	192.00 €	

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
9.	**INFORMATION & COMMUNICATIONS TECHNOLOGY (ITC)**					
9.1.4	**Fire Detection System**					
9.1.4.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of					
9.1.4.1.1	Fire Detection Devices:					
9.1.4.1.1.1	- Repeater alarm panel sounder/beacons Orange	Un	2	576.00 €	1,152.00 €	
9.1.4.1.1.2	- Manual call points	Un	4	210.00 €	840.00 €	
9.1.4.1.1.3	- Optical smoke detector including detector base	Un	32	54.00 €	1,728.00 €	
9.1.4.1.1.4	- Siren including base	Un	1	222.00 €	222.00 €	
9.1.4.1.2	Electrical cables:					
9.1.4.1.2.1	Enclosed in a recessed or surface conduiting:					
9.1.4.1.2.1.1	- JE-H(st)H 2x2x0.8mm²	ml	210	2.64 €	554.40 €	
9.1.4.1.2.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
9.1.4.1.2.2.1	- JE-H(st)H 2x2x0.8mm²	ml	120	3.84 €	460.80 €	
9.1.4.1.3	Metric Rigid Conduit:					
9.1.4.1.3.1	Enclosed in a recessed or surface conduiting:					
9.1.4.1.3.1.1	- PVC Ø 20 mm	ml	200	0.78 €	156.00 €	
9.1.4.1.4	Others:					
9.1.4.1.4.1	- Engineering, System Programming, including System Testing, Commissioning and	Gv	1	2,880.00 €	2,880.00 €	
9.1.5	**Complementary Work**					
9.1.5.1	Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	Gv	1	1,200.00 €	1,200.00 €	
9.1.5.1.1	- Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	Gv	1	1,200.00 €	1,200.00 €	
9.1.6	**Final Work**					
9.1.6.1	- Verification, cleaning and testing of all network.	Gv	1	1,920.00 €	1,920.00 €	
9.1.6.2	- Elaboration of the pieces drawn according to the work executed.	Gv	1	1,020.00 €	1,020.00 €	
TOTAL ITC						26,890.92 €

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
10	**Ventilation and Air Conditioning (VAC)**					
	BLOCK E					175,131.00 €
10.1	**Ventilation and Air Conditioning (VAC)**					
10.1.1	**Ducts and Casings (Section 3/4/6)**					
10.1.1.1	Supply and installation of rectangular galvanized steel ductwork and fittings including hangers and washers covered in an approved vapour seal, complete with duct cladding, volume control dampers, fire dampers, supports and all required accessories as per technical specifications and drawings.					
10.1.1.1.1	- rectangular galvanized steel ductwork without insulation	m^2	4.00	60.00 €	240.00 €	
10.1.1.1.2	- rectangular galvanized steel ductwork with insulation	m^2	35.00	80.00 €	2,800.00 €	
10.1.1.1.3	- rectangular galvanized steel ductwork with insulation and protection by aluminium cladding	m^2	75.00	110.00 €	8,250.00 €	
10.1.1.2	Supply and installation of spiral galvanized steel ductwork and fittings including hangers and washers covered in an approved vapour seal, complete with duct cladding, volume control dampers, fire dampers, supports and all required accessories as per technical specifications and drawings.					
10.1.1.2.1	- Spiral galvanized steel ductwork without insulation					
10.1.1.2.1.1	- DN 150	ml	2.50	60.00 €	150.00 €	
10.1.1.2.2	- Spiral galvanized steel ductwork with insulation					
10.1.1.2.2.1	- DN 300	ml	40.00	120.00 €	4,800.00 €	
10.1.1.2.2.2	- DN 315	ml	4.10	140.00 €	574.00 €	
10.1.1.3	Supply and installation of flexible air duct, aluminium, thermal insulated, including hangers, complete with duct cladding, and all required accessories as per technical specifications and drawings.					
10.1.1.3.1	- DN 315	ml	8.00	100.00 €	800.00 €	
10.1.1.4	Access Doors Supply and installation of square / rectangle access doors with rectangular or flat section ductwork, including supports and all required accessories as per technical specifications and drawings.	Gv	1.00	140.00 €	140.00 €	
10.1.2	**Air Duct Accessories (Section 7)**					
10.1.2.1	Supply and installation of dampers constructed from sheet steel frame and aluminium profile blades, complete with fittings, hangers and all required accessories as per technical specifications and drawings.	Gv	1.00	1,000.00 €	1,000.00 €	
10.1.3	**VAC Fans (Section 8)**					
10.1.3.1	Supply and installation of exhaust and ceiling fans complete with fittings, flexible connectors, spring mount vibration isolators, frequency inverter, protection against corrosion and all required accessories as specified in schedules of equipment, detailed drawings and technical specifications.					
10.1.3.1.1	Exhaust fans type circular duct fan in plastic casing					
10.1.3.1.1.1	- EF4 - S&P TD-500/150	Un	1.00	1,350.00 €	1,350.00 €	
10.1.3.1.2	Exhaust wall mounted Fan					
10.1.3.1.2.1	- EF2 - S&P Silent 300	Un	1.00	100.00 €	100.00 €	
10.1.3.1.2.2	- EF3 - S&P Silent 300 (ceiling mounted)	Un	2.00	150.00 €	300.00 €	
10.1.3.1.3	Ceiling fans					
10.1.3.1.3.1	- CF1 - Ceiling fan - S&P HTB 75 RC	Un	3.00	100.00 €	300.00 €	
10.1.3.1.3.2	- CF3 - Ceiling fan - S&P HTB 150 RC	Un	2.00	150.00 €	300.00 €	
10.1.4	**Air Handling Units - Hygienic (Section 9)**					
10.1.4.1	Supply and installation of air handling units with hygienic construction (non-certified), complete with integrated controls, DX battery, mixing box, fittings, flexible connectors, spring mount vibration isolators, motorized volume damper, strainers, check valves, sound attenuators, thermostat, protection against corrosion, etc. and all required accessories as specified in schedules of equipment, detailed drawings and technical specifications.					
10.1.4.1.1	- DX AHU with integrated control - EVAC UTA-h 40 plus 50	Un	2.00	15,000.00 €	30,000.00 €	

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
10	**Ventilation and Air Conditioning (VAC)**					
10.1.4.2	Supply and installation of control box (controls the expansion valve set and outdoor unit(s) capacity, with Expansion valve set (refrigerant flow and pressure control in DX coil) and all required accessories as specified in schedules of equipment, detailed drawings and technical specifications.					
10.1.4.2.1	- DX AHU PAHCMR000+PRLK048A0	Un	2.00	6,000.00 €	12,000.00 €	
10.1.4.3	Supply and installation of wire remote.					
10.1.4.3.1	- DX AHU PREMTB001	Un	2.00	2,500.00 €	5,000.00 €	
10.1.4.4	Supply and installation of AHU Controller - PACS5A000	Un	2.00	2,500.00 €	5,000.00 €	
10.1.5	**Air Outlets And Inlets (Section 10)**					
10.1.5.1	Supply and installation of terminal hoods enable the installation of absolute filters directly into sterile and cleanroom environments, made of a frame to hold a DELTA mini-pleat absolute filter, a thermoformed polystyrene plenum and a diffuser, including filter HEPA 14, connections to ductwork with plenum box insulated and flexible duct and all required accessories as					
10.1.5.1.1	DIF1 - Terminal diffusers with plenum box filter Hepa H14 for operating room 1200x600	Un	8.00	2,500.00 €	20,000.00 €	
10.1.5.2	Supply and installation of return air grille including filter G4 to operating room, connections to ductwork with plenum box and flexible duct and all required accessories as per technical specifications and drawings.					
10.1.5.2.1	- FGF1 - 332x332 + Filter G4	Un	4.00	300.00 €	1,200.00 €	
10.1.5.2.2	- FGF2 - 332x637 + Filter G4	Un	4.00	300.00 €	1,200.00 €	
10.1.5.3	Supply and installation of exhaust air grille with single deflection including connections to ductwork with plenum box and flexible duct and all required accessories as per technical specifications and drawings.					
10.1.5.3.1	- FG1 - 200x100	Un	2.00	100.00 €	200.00 €	
10.1.5.4	Supply and installation of door grille complete with all accessories as per technical specifications and drawings					
10.1.5.4.1	- ATG1 - 200x100	Un	1.00	100.00 €	100.00 €	
10.1.5.5	Supply and installation of exhaust air louvers complete with insect screen and gravity shutters including connections to ductwork and all required accessories as per technical specifications and drawings.					
10.1.5.5.1	- FL1 - 200x200	Un	1.00	100.00 €	100.00 €	
10.1.6	**Split Air Conditioners (Section 11)**					
10.1.6.1	Supply and installation of outdoor units, including integral controls, protection device, protection against corrosion, complete with condensate piping, as per technical specifications and drawings.					
10.1.6.1.1	CDU1 - LGS09EQ.UA3	Un	2.00	600.00 €	1,200.00 €	
10.1.6.1.2	CDU3 - LGS18EQ.UL2	Un	4.00	800.00 €	3,200.00 €	
10.1.6.1.3	CDU4 - LGS24EQ.SSK	Un	2.00	1,000.00 €	2,000.00 €	
10.1.6.2	Supply and installation of indoor units, including wired remote control, accessories, supports as per technical specifications and drawings.					
10.1.6.2.1	FCU1 - LGS09EQ.NSJ	Un	2.00	300.00 €	600.00 €	
10.1.6.2.2	FCU3 - LGS18EQ.NSK	Un	4.00	400.00 €	1,600.00 €	
10.1.6.2.3	FCU4 - LGS24EQ.NSK	Un	2.00	500.00 €	1,000.00 €	
10.1.7	**VRF Air Condensator (Section 12)**					
10.1.7.1	Supply and installation of outdoor units for AHU connection, including integral controls, protection device, protection against corrosion, complete with condensate piping, as per technical specifications and drawings.					
10.1.7.1.1	CDU5 - LG ARUM080LTE5	Un	2.00	12,000.00 €	24,000.00 €	
10.1.8	**HVAC Testing, Adjusting and Balancing (Section 13)**					
10.1.8.1	Final tests of the installation including balancing, adjusting, commissioning and handling to client complete operational systems and equipment as per technical specifications and drawings. installation according to drawings	Gv	1.00	15,000.00 €	15,000.00 €	
10.2	**Hydraulic Installations VAC**					
10.2.1	**Refrigerant Piping (Section 14)**					
10.2.1.1	Supply and installation of refrigeration tube - EN 12735-1, copper tube designed specifically for refrigeration and air conditioning use and accordingly cleaned, nitrogen-purged and capped, complete with all necessary fittings, supports and all required accessories as technical specifications and drawings.					

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
10	**Ventilation and Air Conditioning (VAC)**					
10.2.1.1.1	Copper with thermal insulation and protection exposed pipe by aluminium cladding					
10.2.1.1.1.1	- Liq Ø6.4 mm / Gas Ø9.5 mm	ml	8.80	50.00 €	440.00 €	
10.2.1.1.1.2	- Liq Ø6.4 mm / Gas Ø12.7 mm	ml	31.80	60.00 €	1,908.00 €	
10.2.1.1.1.3	- Liq Ø6.4 mm / Gas Ø15.9 mm	ml	8.50	70.00 €	595.00 €	
10.2.1.1.1.4	- Liq Ø6.4 mm / Gas Ø19.1 mm	ml	17.30	80.00 €	1,384.00 €	
10.2.1.1.2	Supply and installation of drainage pipe work complete with all necessary fittings, supports and accessories within building as per technical specifications and drawings.	Gv	1.00	300.00 €	300.00 €	
10.3	**Electrical Installation VAC**					
10.3.1	**Switchboard (Section 15)**					
10.3.1.1	Supply and installation of switchboard including energy meter (equipment with power > 5.5 kW), electrical connections (including wiring and cable paths) to HVAC equipment and all required accessories as per technical specifications and drawings.					
10.3.1.1.1	- S.VAC	Un	1.00	2,500.00 €	2,500.00 €	
10.3.1.2	Supply and installation of electrical circuits for power supply HVAC Equipment, including control cables, cable path with cover for the exterior and all required accessories as shown on drawings and called for in the specifications.	Gv	1.00	3,500.00 €	3,500.00 €	
10.4	**General**					
10.4.1	Identification for VAC Ducting Piping and Equipment.	Gv	1.00	3,000.00 €	3,000.00 €	
10.4.2	Painting, Tagging and Labelling of entire mechanical system as specified.	Gv	1.00	2,000.00 €	2,000.00 €	
10.4.3	Civil works such as making required structural anti vibration base, drilling holes, making openings, putting sleeves, metallic bases for package units with antivibration absorber and all required accessories as shown on					
10.4.3.1	- AHU 1	Un	1.00	1,000.00 €	1,000.00 €	
10.4.3.2	- AHU 2	Un	1.00	1,000.00 €	1,000.00 €	
10.4.4	Maintenance for two years (guarantee period), including supply of all needed spare parts during the year.	Gv	1.00	10,000.00 €	10,000.00 €	
10.4.5	Transport of Equipment VAC	Gv	1.00	3,000.00 €	3,000.00 €	

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
11	**MECHANICAL INSTALLATIONS** **MEDICAL GASES**					
11.1	**BLOCK E**					**39,551.00 €**
11.1.4	**SECTION 4**					
11.1.4.1	COPPER PIPELINE					
11.1.4.1.1	Supply and assembly of copper tube suitable for medical gases (according to EN 13348), degreased, deoxidized, arsenic-free, silver-welded (silver content not less than '40% of this), plugged at the ends, with certificate issued by the manufacturer. including all connection accessories. for:					
11.1.4.1.1.1	Ø 8 x 10 mm for to gas O_2	m	17.0	21.00 €	357.00 €	
11.1.4.1.1.2	Ø 10 x 12 mm for to gas O_2	m	221.0	23.00 €	5,083.00 €	
11.1.4.1.1.3	Ø 8 x 10 mm for to gas N_2O	m	81.0	21.00 €	1,701.00 €	
11.1.4.1.1.4	Ø 10 x 12 mm for to gas N_2O	m	12.0	23.00 €	276.00 €	
11.1.4.1.1.5	Ø 8 x 10 mm for to gas MCA	m	308.0	21.00 €	6,468.00 €	
11.1.4.1.1.6	Ø 10 x 12 mm for to gas MCA	m	22.0	23.00 €	506.00 €	
11.1.4.2	IDENTIFICATION OF PIPELINES					
11.1.4.2.1	Identification of pipework throughout their length, whether mounted in false ceiling or buried piping . in conventional color or with labels	vg	1.0	260.00 €	260.00 €	
11.1.4.3	AUTOMATIC CUT-OFF Automatic cut-off safety set of N2O in the absence of O2	un	1.0	850.00 €	850.00 €	
11.1.4.4	MEDICAL GAS OUTLETS					
11.1.4.4.1	Supply and assembly of outlets double-sided, with internal filter, with CE marking, manufactured according to ISO 7396-1 2016 for the following gases:					
11.1.4.4.1.1	O_2	un	14.0	95.00 €	1,330.00 €	
11.1.4.4.1.2	MCA	un	14.0	95.00 €	1,330.00 €	
11.1.4.5	BALL VALVES					
11.1.4.4.1	Supply and assembly of 1/4 turn isolating valves, manufactured according to ISO 7396-1: 2016. for network sectioning. for:					
11.1.4.4.1.1	Ø 8 x 10 mm for to gas O_2	un	15.0	110.00 €	1,650.00 €	
11.1.4.4.1.2	Ø 8 x 12 mm for to gas N_2O	un	9.0	120.00 €	1,080.00 €	
11.1.4.4.1.3	Ø 8 x 10 mm for to gas MCA 4.5 bar	un	15.0	110.00 €	1,650.00 €	
11.1.4.4.1.4	Ø 8 x 10 mm for to gas MCA 8 bar	un	1.0	110.00 €	110.00 €	
11.1.4.5	PRESSURE REDUCTION					
11.1.4.5.1	Supply and assembly of second reduction for O2 in pressure 8 bar / 4,8 bar, with Medical Device marking 93/42 / EEC, in simple, manufactured according to ISO 7396-1: 2016.	un	1.0	1,300.00 €	1,300.00 €	
11.1.4.5.2	Supply and assembly of second reduction for N2O in pressure 8 bar / 4,2 bar, with Medical Device marking 93/42 / EEC, in simple, manufactured according to ISO 7396-1: 2016.	un	1.0	1,300.00 €	1,300.00 €	
11.1.4.5.3	Supply and assembly of second reduction for MCA in pressure 8 bar / 4,5 bar, with Medical Device marking 93/42 / EEC, in simple, manufactured according to ISO 7396-1: 2016.	un	1.0	1,300.00 €	1,300.00 €	
11.1.5	**SECTION 5**					
11.1.5.1	ALARMS SYSTEM					
11.1.5.1.1	Local electronic-type alarm including pressure sensors across the network (O_2) and all connections, with CE device marking medical and according to ISO 7396-1: 2016. Brand: Air Liquide Medicinal	un	1.0	1,100.00 €	1,100.00 €	
11.1.5.1.2	Local electronic-type alarm including pressure sensors across the network (N_2O) and all connections, with CE device marking medical and according to ISO 7396-1: 2016. Brand: Air Liquide Medicinal	un	1.0	1,100.00 €	1,100.00 €	
11.1.5.1.3	Local electronic-type alarm including pressure sensors across the network (MCA 4,5bar) and all connections, with CE device marking medical and according to ISO 7396-1: 2016. Brand: Air Liquide Medicinal	un	1.0	1,100.00 €	1,100.00 €	
11.1.5.1.4	Local electronic-type alarm including pressure sensors across the network (MCA 4,5bar) and all connections, with CE device marking medical and according to ISO 7396-1: 2016. Brand: Air Liquide Medicinal	un	1.0	1,100.00 €	1,100.00 €	
11.1.6	**SECTION 6**					
11.1.6.1	ELECTRICAL INSTALLATIONS					
11.1.5.1.1	Electrical connections to the alarm system	un	3.0	200.00 €	600.00 €	
11.1.6.2	TESTE AND EXPERIENCE					
11.1.6.2.1	Construction and electricity works	vg	1.0	1,900.00 €	1,900.00 €	
11.1.6.2.2	Tests and experiences with the delivery of certificates signed by the contractor and inspection. according to the standard and ISO 7396-1: 2016	vg	1.0	1,600.00 €	1,600.00 €	
11.1.6.2.3	Final screens with the traces of the medical gas networks	vg	1.0	1,300.00 €	1,300.00 €	
11.1.6.3	SATT TRAINING					
11.1.6.3.1	Staff training and warranty and maintenance for two years (guarantee period), including supply of all needed spare parts during the year.	vg	1.0	3,200.00 €	3,200.00 €	

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
13	**FIRE SAFETY**					
13.1	**BLOCK E**					**5,140.00 €**
13.1.1	**EMERGENCY SIGNS**					
13.1.1.1	Application of emergency signs, in accordance with the fire safety project, with the following dimensions:					
13.1.1.1.1	**200 x 200 mm:**					
13.1.1.1.1.1	S1 - Fire extinguisher	un	11.0	60.00 €	660.00 €	
13.1.1.1.2	**150 x 200 mm:**					
13.1.1.1.2.1	S2 - Fire Alarm	un	7.0	45.00 €	315.00 €	
13.1.1.1.2.2	S4 - Fire Hose	un	6.0	45.00 €	270.00 €	
13.1.1.1.2.3	S5 - Fire extinguisher Instructions for use, Carbon Dioxide	un	1.0	45.00 €	45.00 €	
13.1.1.1.2.4	S6 - Fire extinguisher Instructions for use, ABC Powder	un	10.0	45.00 €	450.00 €	
13.1.1.1.3	**300 x 300 mm:**					
13.1.1.1.3.1	P1 - Warning, Elecric switch	un	8.0	75.00 €	600.00 €	
13.1.1.1.4	PE - Application of Escape Plan and simplified instructions, in accordance with the fire safety project.	un	6.0	75.00 €	450.00 €	
13.1.2	**MEANS OF FIRST INTERVENTION**					
13.1.2.1	**EXTINGUISHERS**					
13.1.2.1.1	Installation of portable fire extinguishers with the following characteristics:					
13.1.2.1.1.1	ABC Powder, 6kg	un	10.0	210.00 €	2,100.00 €	
13.1.2.1.1.2	Carbon Dioxide (CO_2), 5kg	un	1.0	250.00 €	250.00 €	

Original

REHABILITATION OF THE SAUDI MATERNITY HOSPITAL KASSALA HEALTH CITADEL - SUDAN **BOQ - BILL OF QUANTITY** **PACKAGE 4- IPD (delivery department) | BLOCK H & I**		
CODE	**DISCIPLINE**	**VALUE**
1	Architectural	85,107.11 €
2	STRUCTURES	0.00 €
3	WATER SUPPLY SYSTEM	9,049.50 €
4	WASTEWATER DRAINAGE SYSTEM	26,584.00 €
5	STORMWATER DRAINAGE SYSTEM	4,350.00 €
6	FIREFIGHTING WATER SYSTEM	4,510.00 €
7	ELECTRICAL INSTALLATIONS	24,505.00 €
8	INFORMATION & COMMUNICATIONS TECHNOLOGY (ITC)	16,796.88 €
9	AIR CONDITIONING AND VENTILATION	19,130.00 €
10	MEDICAL GASES	0.00 €
11	FIRE SAFTY	2,175.00 €
TOTAL		**192,207.49 €**

Original

Project: Rehabilitation of the Saudi Maternity Hospital **Location:** Kassala Health Citadel, Sudan

Date: 31 January 2020 **UNOPS**

BILL OF QUANTITIES-PACK 4-ARC

NOTES:
1. The articles include all the preparatory and basic work, including all the materials and accessories, required for their execution and perfect finish.
2. All materials to be demolished or removed shall be considered as reusable and all necessary actions must be taken for their perfect conservation and placed in storage or in the successful tenderer's outlet, all according to the indications of the inspection.

*a.w-all works

**n.a- non applicable

Grand Total-PACK 4-ARC 85,107.11

Art°	Description of works	Un.	Quant.	Unit Price	Total
CHAPTER A - CONSTRUCTION SITE					
1.	Construction site assembly and disassembly, including plate construction site identifier and fencing; provisional installations namely for the developer; supervision; materials warehouse; equipment and tools; facilities for personnel services; sanitary facilities; provisional networks	a.w	1	2,000.0	2,000.00
2.	Implementation and development of the health,safety and security plan	a.w	1	1,500.0	1,500.00
3.	Implementation and development of the prevention, construction and demolition waste management	a.w	1	2,000.0	2,000.00
4.	Execution of the final cleaning of the work, including all the necessary work and removal from the contractor's deposit of surplus products	a.w	1	1,000.0	1,000.00
CHAPTER B - DEMOLITIONS					
1.	Demolition element by element from the roof, of all the elements proposed for demolition, including removal single element with temporary shoring if necessary, removal and classification of debris and waste, for subsequent transport to the authorised outlet, all necessary work, materials and equipment.	a.w	1	100.0	100.00
2.	Execution of all necessary survey work/ disassembly of water installations and equipment, existing sewers, electrics, telephone, etc., including loading, carriage to and unloading of all cargoes materials.	a.w	1	50.0	50.00
3.	Demolition of existing brick walls, according to demolition plan, including removal of products from demolition, to dumping ground, to any distance	a.w	1	50.0	50.00
4.	Demolition of existing indoor and outdoor doors and windows according to demolition plan, including removal of products from demolition, to dumping ground, to any distance.	a.w	1	50.0	50.00
5.	Execution of demolition of existing indoor floors of ceramic tiles, for subsequent application of new coatings including removal of products from demolition, to dumping ground, at any distance.	a.w	1	50.0	50.00
6.	Execution of removal of existing bathroom fittings, including removal of products from demolition, to dumping ground, at any distance.	a.w	1	50.0	50.00
7.	Existing walls to be demosidhed according to demolition plan	m2	4.2	1.0	4.20
CHAPTER C - GENERAL CIVIL AND INFRASTRUCTURE CONSTRUCTION					
1	WALLS				
1.1	Exterior Walls				
1.1.1	P1 -nominated on the project as Skin Wall; baked terracota pieces (please see detail on shett A.05.02)	m2	53.68	50.0	2,684.00

Continuation of chapter C

1	WALLS				
1.1	Exterior Walls				
1.1.2	P2- nominated on the project as Thermal Block; 20cm thermal clay brick with massive brick exterior covering (please see detail on shett A.05.02)	m2	75.33	35.0	2,636.55
1.2	Interior Walls				
1.2.1	P3-Internal mineral insulation liner with plasterboard covering (please see detail on shett A.05.02)	m2	n.a	18.0	
1.2.2	P4- Interior plasterboard partition (please see detail on shett A.05.02)	m2	n.a	25.0	
1.2.3	P5- 11 cm brick double plastered (please see detail on shett A.05.02)	m2	17.36	27.0	468.72
1.2.4	P6- 15cm brick double plastered (please see detail on shett A.05.02)	m2	n.a	30.0	
1.2.5	P7- 20cm brick double plastered (please see detail on shett A.05.02)	m2	n.a	30.0	

2	FENCE				
2.1	Proposed:nominated on the project as Skin Wall; with baked terracota pieces (please see sheet number: A.05.03- Constructive Details,Walls Fence)	m/l	n.a	70.0	
2.2	Future Expansion: nominated on the project as Skin Wall; with baked terracota pieces (please see sheet number: A.05.03- Constructive Details,Walls Fence)	m/l	n.a	50.0	
3	COATINGS				
3.1	Coatings Interior Walls				
3.2.1	W2- 0.15x0.15m white ceramic tiles till 2.10m height	m2	102.95	20.0	2,059.00
3.2	Coatings Interior Flooring				
3.2.1	F2- 0.30x0.30m Porcelanic tiles,Anti-split, Grey colored	m2	44.11	20.0	882.20
3.2.2	F2- Baseboard	m/l	n.a		
3.2.3	F3- 0.60x0.60m Porcelanic tiles, Grey colored	m2	n.a	20.0	
3.2.4	F3- Baseboard	m/l	n.a	6.0	
3.2.5	F4- 0.60x0.60m Porcelanic tiles, Grey colored	m2	n.a	20.0	
3.2.6	F4- Baseboard	m/l	n.a	6.0	
3.2.7	F5-0.60x0.60m Porcelanic tiles,Yellow colored	m2	238.11	20.0	4,762.20
3.2.8	F5- Baseboard	m/l	200.63	6.0	1,203.78

Continuation of chapter C

3	COATINGS				
3.2	Coatings Interior Flooring				
3.2.9	F6-0.60x0.60m Porcelanic tiles, Purple colored	m2	251.06	20.0	5,021.20
3.2.10	F6- Baseboard	m/l	n.a	6.0	
3.2.11	F7-0.60x0.60m Porcelanic tiles, Blue colored	m2	32.08	22.0	705.76
3.2.12	F7- Baseboard	m/l	45.59	6.0	273.54
3.2.13	F8-0.60x0.60m Porcelanic tiles, Blue colored	m2	n.a	22.0	
3.2.14	F8- Baseboard	m/l	n.a	6.0	
4	CEILINGS				
4.1	Interior Ceilings				
4.1.1	Supply and execution of false interior ceiling: waterproofing plasterboard to be painted with paint (W1) including transport, unloading, support structure, backstrips, bars and reinforcements, relapses, opening of negatives for lighting, all complementary materials, works and accessories	m2	n.a	15.0	
5	INTERIOR PAVING				
5.1	Floor levelling with screed levelling before the applyance of new coatings	a.w	1	500.0	500.00
6	PAINTINGS				
6.1	Exterior Paintings				
6.1.1	E2- "terracota" acrylic paint (RAL colour 2013)	m2	1175.41	4.0	4,701.64
6.1.2	E3 -"concrete grey" acrylic paint (RAL colour 7023)	m2	425.30	4.0	1,701.20
6.1.3	E4-"pure white" poliuretane paint for metalic structure (RAL colour 9010)	m2	n.a	4.0	
6.2	Interior Paintings				
6.2.1	W1-Washable acrylic white paint	m2	1226.53	4.0	4,906.12
7	WOODWORK				
7.1	A1:MDF 20mm WITH HPL; 3,40 x 0,70 x 1,10m	un	n.a	1,000.0	
7.2	A2:MDF 20mm WITH HPL; 1,20 x 0,70 x 1,10m	un	n.a	480.0	
7.3	A3:MDF 20mm WITH HPL; 1,10 x 0,70 x 1,10m)+(2,50 x 0,70 x 1,10m)	un	n.a	1,800.0	
7.4	A4:MDF 20mm WITH HPL; 2,10 x 0,70 x 1,10m	un	n.a	800.0	
7.5	A5: MDF 20mm WITH HPL; 2,55 x 0,70 x 1,10m	un	n.a	900.0	
7.6	B1: MDF 20mm WITH HPL ;1,65 x 0,60 x 0,90m	un	n.a	600.0	
7.7	B1': MDF 20mm WITH HPL; 1,65 x 0,35 x 0,60m	un	n.a	300.0	
7.8	B2: MDF 20mm WITH HPL; 2,15 x 0,60 x 0,90m	un	n.a	750.0	
7.9	A3':MDF 20mm WITH HPL; 2,5 x 0,70 x 1,10m)+(1,10 x 0,70 x 1,10m)	un	n.a	1,800.0	

7	WOODWORK				
7.10	B2': MDF 20mm WITH HPL; 2,15 x 0,35 x 0,60m	un	n	350.0	
7.11	B3: MDF 20mm WITH HPL; 1,90 x 0,60 x 0,90m	un	1	700.0	700.00
7.12	B3':MDF 20mm WITH HPL; 1,90 x 0,35 x 0,60m	un	1	300.0	300.00
7.13	B4: MDF 20mm WITH HPL; 2,55 x 0,60 x 0,90m	un	n.a	900.0	
7.14	B4': MDF 20mm WITH HPL;2,55 x 0,35 x 0,60m	un	n.a	400.0	
7.15	B5: MDF 20mm WITH HPL; 1.80 x 0,60 x 0,90m	un	n.a	700.0	
7.16	B6: MDF 20mm WITH HPL; 1.50 x 0,60 x 0,90m	un	2	600.0	1,200.00
7.17	C1: MDF 30mm WITH HPL; 1,65 x 0,60 x 0,75m	un	n.a	400.0	
7.18	C2: MDF 30mm WITH HPL; 1,70 x 0,60 x 0,75m	un	n.a	400.0	
7.19	C3: MDF 30mm WITH HPL; 2,20 x 0,60 x 0,75m	un	n.a	500.0	
7.20	C4:MDF 30mm WITH HPL; 2,40 x 0,60 x 0,75m	un	n.a	550.0	
7.21	C5: MDF 30mm WITH HPL;2,10 x 0,60 x 0,75m	un	n.a	500.0	
7.22	C6: MDF 30mm WITH HPL;1,90 x 0,60 x 0,75m	un	1	450.0	450.00
7.23	D1: MDF 50mm WITH HPL;4,95 x 0,70 x 0,75m	un	n.a	950.0	
7.24	D2: MDF 50mm WITH HPL;1,70 x 0,70 x 0,75m	un	n.a	350.0	
8	DOORS				
8.1	Exterior Doors				
8.1.1	**G.1-** Double swing gate with fixed lateral sashes / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047" (dim. 4,22x2,10m). All accessories included.	un	n.a	850.0	
8.1.2	**G.2-** Double swing gate with fixed lateral sashes / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047" (dim. 2,40x2,10m). All accessories included.	un	n.a	600.0	
8.1.3	**G.3-** Single swing gate with 1 fixed lateral sash / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 1,62x2,10m). All accessories included.	un	2	500.0	1,000.00
8.1.4	**G.4-** Double swing gate / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 1,65x2,10m). All accessories included.	un	1	550.0	550.00
8.1.5	**G.5-** Double swing gate with fixed lateral sashes / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 3,54x2,10m). All accessories included.	un	n.a	750.0	
8.1.6	**G.6-** Single swing gate with 1 fixed lateral sash / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 2,00x2,10m). All accessories included.	un	n.a	550.0	
8.1.7	**G.6-** Single swing gate with 1 fixed lateral sash / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 1,50x2,10m). All accessories included.	un	3	500.0	1,500.00
8.2	Interior Doors				
8.2.1	**D.1-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,70x2,10m). Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	10	1,000.0	10,000.00
8.2.2	**D.2-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,80x2,10m). Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,000.0	
8.2.3	**D.3-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,90x2,10m). Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	2	1,000.0	2,000.00
8.2.4	**D.4-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,80x2,70m). Upper transom with a boom hung sash / 5+ 5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,200.0	
8.2.5	**D.5-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,85x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	4	1,200.0	4,800.00
8.2.6	**D.6-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 1,00x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,200.0	
8.2.7	**D.7-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 1,10x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	10	1,250.0	12,500.00
8.2.8	**D.8-** Double swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 1,60x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Panic bar in stainless steel. All accessories included.	un	n.a	1,500.0	
8.2.9	**D.9-** Hermec sliding door / Hermetic system class 4, according UNI EN 12207 "Grupsa HS-201" / sheet of stainless steel (dim. 1,40x2,10m). No handle, automatic opening system. All accessories included.	un	n.a	1,400.0	
8.2.10	**D.10-** Single swing door / MDF or plywood / thermal laminate HPL "light grey RAL 7047" with a kick board in stainless steel (dim. 1,00x3,10m). Upper transom with a fixed sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,500.0	
8.2.11	**D.11-** Double swing door / MDF or plywood / thermal laminate HPL "light grey RAL 7047" with a kick board in stainless (dim. 1,50x3,10m). Upper transom with a fixed sash / 5+ 5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,900.0	
8.2.12	**D.11-** Double swing door / MDF or plywood / thermal laminate HPL "light grey RAL 7047" with a kick board in stainless (dim. 1,60x3,10m). Upper transom with a fixed sash / 5+ 5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,900.0	

8.3	Technical cabinets				
8.3.1	**TC.1**- Technical cabinet with double swing door / MDF or plywood / thermal laminate HPL white " RAL 9010" (dim. 1,20x2,10). With key / no handle. All accessories included.	un	n.a	700.0	
8.3.2	**TC.2**- Technical cabinet with double swing door / Galvenized steel/ painted "light grey RAL 7047" (dim. 1,20x2,10). With key / no handle. All accessories included.	un	n.a	500.0	
8.3.3	**TC.3**- Technical cabinet with single door / MDF or plywood/ thermal laminate HPL "white RAL 9010" (dim. 0,60x2,10). With key / no handle. All accessories included.	un	n.a	350.0	
8.3.4	**TC.4**- Technical cabinet with double swing door / Galvenized steel/ painted "light grey RAL 7047" (dim. 1,60x2,10). With key / no handle. All accessories included.	un	n.a	700.0	
8.3.5	**TC.5**- Technical cabinet with double swing door /MDF or plywood/thermolaminated "RAL 9010"	un	n.a	800.0	
9	WINDOWS				
9.1	Interior Windows				
9.1.1	**W.1**- Slide and fixed window sashes / Anodized aluminium / Laminated 5+ 5mm clear glass (dim. 3,00x1,20). All accessories included.	un	n.a	450.0	
9.1.2	**W.2**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 2,25x1,50m). All accessories included.	un	n.a	420.0	
9.1.3	**W.3**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,00x1,40m). All accessories included.	un	n.a	175.0	
9.1.4	**W.4**- Boom hung window sash / Anodized aluminium / Laminated 5+5mm clear glass (dim. 0,60x1,50m). All accessories included.	un	4	115.0	460.00
9.1.5	**W.5**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,50x2,00m). All accessories included.	un	3	375.0	1,125.00
9.1.6	**W.6**- Boom hung window sash / Anodized aluminium / Laminated 5+5mm clear glass (dim. 0,75x1,50m). All accessories included.	un	n.a	140.0	
9.1.7	**W.7**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,50x1,50m). All accessories included.	un	n.a	280.0	
9.1.8	**W.8**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,50x1,50m). All accessories included.	un	6	280.0	1,680.00
9.1.9	**W.9**- Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,00x1,30m). All accessories included.	un	n.a	160.0	
9.1.10	**W.10**- Fixed interior window / Anodized aluminium frame / Laminated 5+5mm clear glass (dim. 1,20x1,10m). All accessories included.	un	n.a	165.0	
9.1.11	**W.11**- Fixed interior window / Anodized aluminium frame / Laminated 5+5mm clear glass (dim. 2,20x1,10m). All accessories included.	un	n.a	300.0	
9.2	Shadding				
9.2.1	**S.1**- Existing shutters to be relocated in the west and south exposed windows (dim. 1,50x1,20m). All accessories included.	un	n.a	225.0	
9.3	Window Sill				
9.3.1	Existing Pre-fabricated concrete window sill (same width as the window) to be relocated	un	1	50.0	50.00
10	CANOPY				
10.1	Sandwich Roof Panels				
10.1.1	5 Ribs profiled outer sheet, exterior coating in white paint with good UV resistance (RAL 9010), core in Mineral wool with 80 mm thickness , interior coating: polymer coating resistant to mould (RAL 9010), Fire performance according to TS EN 13501-1,A2-s1	m2	n.a	50.0	
10.2	Downspouts				
10.2.1	Metal downspouts painted in white with good UV resistance (RAL 9010) all joints and connections included	m/l	n.a	5.0	
10.3	Gutters				
10.3.1	White Aluminium gutters, all joints included. Cover of the gutter with a lacquered (RAL 9010) metalic sheet with 48 cm high (please see detail on A,05,02 Walls and Gutters) held in place with metal clamps.	m/l	n.a	8.0	

11	VARIOUS				
11.1	Supply and placement of break-proof mirrors placed complanarly with the tile, including transportation, discharge, fixing accessories, tapes and all materials and complementary accessories. Mirror: 1,2m height with variable lenght	m2	7.2	60.0	432.00
CHAPTER D - installation AND EQUIPMENT OF WATER AND SEWAGE SYSTEM					
1.	SANITARY EQUIPMENT				
1.1	Supply and laying of ceramic sanitary ware white glazed including transport, unloading, fastenings and connections, seals and all complementary materials, works and accessories	a.w	1	500.0	500.00
1.2	Toilets	un	3	500.0	1,500.00
1.3	Disabled Toilets	un	n.a	1,000.0	
1.4	Disabled Toilets Bars kits	un	n.a	500.0	
1.5	Squating Toilet	un	n.a	500.0	
1.6	Basin white glazed. dimensions: 45*35	un	n.a	350.0	
1.7	Basin white glazed. dimensions: 60*45	un	6	350.0	2,100.00
1.8	Shower Kit	un	8	300.0	2,400.00
1.9	Drain	un	8	50.0	400.00
1.10	Foot washing bathtub	un	n.a	100.0	
1.11	Kitchen Sink	un	n.a	300.0	
1.12	Scrub Basin in stainless steel	un	n.a	2,000.0	
1.13	CSSD Basin	un	n.a	2,500.0	
1.14	Soiled Tray	un	1	100.0	100.00
CHAPTER E - LANDSCAPING					
10.1	Paving				
10.1.1	EF1-Resistent concrete pieces above a compacted pavement (vehicle road)	m2	n.a	35.0	
10.1.2	EF2-Concrete pieces (pedestrian sidewalk)	m2	n.a	35.0	
10.1.3	EF3-Compacted gravel	m2	n.a	8.0	
10.1.4	EF4-Earth and humus to plant resistant type grass	m2	n.a	3.0	

10.1.5	Smoothed concrete floor with a siloxane sealer (exterior corridor)	m2	n.a	35.0	
10.2	Forestation				
10.2.1	New trees (local species to be defined)	un	n.a	100.0	
10.2.1	New bushes (local species to be defined)	m/l	n.a	30.0	
	Total for PACK 4-ARC				85,107.11

End of BoQ_Saudy Maternity Hospital_31 January 2020

Original

REHABILITATION OF THE SAUDI MATERNITY HOSPITAL KASSALA HEALTH CITADEL - SUDAN **BOQ - BILL OF QUANTITY** **Package 4 (Block H, I)**		
CODE	**DISCIPLINE**	**VALUE**
4	WATER SUPPLY SYSTEM	9,049.50 €
5	WASTEWATER DRAINAGE SYSTEM	26,584.00 €
6	STORMWATER DRAINAGE SYSTEM	4,350.00 €
7	FIREFIGHTING WATER SYSTEM	4,510.00 €
TOTAL		**44,493.50 €**

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
4.	**WATER SUPPLY SYSTEM**					
4.1	**Package 4 (Block K, H, I)**					**9,049.50 €**
4.1.1	**Pipping**					
4.1.1.1	Supply and installation of PP-R Pipes for the water supply netwotk, with thermal insulation in hot water, including all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.1.1.1	Cold Water:					
4.1.1.1.1.1	Ø 16 mm	m	82.00	3.00 €	246.00 €	
4.1.1.1.1.2	Ø 20 mm	m	56.00	3.00 €	168.00 €	
4.1.1.1.1.3	Ø 25 mm	m	41.00	3.50 €	143.50 €	
4.1.1.1.1.4	Ø 32 mm	m	116.00	3.50 €	406.00 €	
4.1.1.1.1.5	Ø 40 mm	m	25.70	10.00 €	257.00 €	
4.1.1.1.1.6	Ø 50 mm	m	12.00	15.00 €	180.00 €	
4.1.1.1.2	Hot Water:					
4.1.1.1.2.1	Ø 20 mm	m	33.00	3.00 €	99.00 €	
4.1.1.2	Supply and installation of HDPE pipeor the water supply network, buried, including earthworks and installation, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.1.2.1	Cold Water:					
4.1.1.2.1.1	Ø 40 mm	m	2.50	10.00 €	25.00 €	
4.1.1.2.1.2	Ø 50 mm	m	16.00	15.00 €	240.00 €	
4.1.2	**Equipment and Accessories**					
4.1.2.1	Supply and installation of angles Valves, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following equipments:					
	Wash Basin					
	- In cold water:	un	36	6.00 €	216.00 €	
	WC Cistern					
	- In cold water:	un	39	6.00 €	234.00 €	
4.1.2.2	Supply and installation of Valves, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.2.2.1	Ø 20 mm	un	16	7.00 €	112.00 €	
4.1.2.2.2	Ø 25 mm	un	8	7.00 €	56.00 €	
4.1.2.2.3	Ø 32 mm	un	3	9.00 €	27.00 €	
4.1.2.2.4	Ø 40 mm	un	2	10.00 €	20.00 €	
4.1.2.3	Supply and installation of shut-off buried Valves, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.2.3.1	Ø 40 mm	un	1	120.00 €	120.00 €	
4.1.2.3.2	Ø 50 mm	un	2	150.00 €	300.00 €	
4.1.2.4	Supply and installation of eletrical heaters with acumulation tank, includind shut-off valves, retention valves, electrical connection work, and all accessories, and all works and materials and accessories necessary to a correct execution of the task, with the following capacities:					
4.1.2.4.1	50L horizontal	un	2	250.00 €	500.00 €	
4.1.2.4.2	80L horizontal	un	4	300.00 €	1,200.00 €	
4.1.3	**Complementary Work**					
4.1.3.1	Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	1,000.00 €	1,000.00 €	
4.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	750.00 €	750.00 €	
4.1.4	**Final Work**					
4.1.4.1	Verification, cleaning and testing of all network.	gv	1	1,250.00 €	1,250.00 €	
4.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	1,500.00 €	1,500.00 €	

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
5.	**WASTEWATER DRAINAGE SYSTEM**					
5.1	**Package 4 (Block K, H, I)**					**26,584.00 €**
5.1.1	**Pipping**					
5.1.1.1	Supply and installation of PVC pipes for buried/embedded wastewater drainage network (inside building), installed in proper ditches, as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans and construction supervision instructions, with the following diameters:					
5.1.1.1.1	Ø 40 mm	m	57.00	4.00 €	228.00 €	
5.1.1.1.2	Ø 75 mm	m	46.00	6.00 €	276.00 €	
5.1.1.1.3	Ø 90 mm	m	120.00	10.00 €	1,200.00 €	
5.1.1.2	Supply and installation of PVC pipes for buried/embedded wastewater drainage network (outside building), installed in proper ditches, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans and construction supervision instructions, with the following diameters:					
5.1.1.2.1	Ø 110 mm	m	112.00	10.00 €	1,120.00 €	
5.1.1.2.2	Ø 125 mm	m	8.00	15.00 €	120.00 €	
5.1.2	**Equipment and Accessories**					
5.1.2.1	Supply and installation of siphon, as well as all the works, materials and accessories necessary to the correct execution of the task, to install on the following equipments:					
5.1.2.1.1	Wash Basin	un	17	250.00 €	4,250.00 €	
5.1.2.1.2	Turkish Toilet	un	22	350.00 €	7,700.00 €	
5.1.2.1.3	Shower	un	12	250.00 €	3,000.00 €	
5.1.2.2	Supply and installation of traps in chrome plated brass, as well as all the works, materials and accessories necessary to the correct execution of the task.	un	10	20.00 €	200.00 €	
5.1.2.3	Supply and installation of ventilation hats, to be installed on the roof, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
5.1.2.3.1	Ø 90 mm	un	5	20.00 €	100.00 €	
5.1.2.4	Supply and installation of PVC floor gully with stainless steel grill, as well as all the works, materials and accessories necessary to the correct execution of the task.	un	2	20.00 €	40.00 €	
5.1.2.5	Execution of a concrete manholes supported by a suitable recessed cast iron covers, load class B125 to receive the same finishing of the floor, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans, detail drawings and construction supervision instructions, with the following dimensions:					
5.1.2.5.1	0.60x0.60	un	9	250.00 €	2,250.00 €	
5.1.2.5.2	0.80x0.80	un	6	300.00 €	1,800.00 €	
5.1.3	**Complementary Work**					
5.1.3.1	Construction work to support the implementation of wastewater networks, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	1,000.00 €	1,000.00 €	
5.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	800.00 €	800.00 €	
5.1.3.3	Evaluation, rehabilitation (if necessary), cleaning and maintenance works of existing networks to be maintained, including all materials and work necessary for their perfect execution.	gv	1	1,000.00 €	1,000.00 €	
5.1.4	**Final Work**					
5.1.4.1	Verification and testing of all network.	gv	1	500.00 €	500.00 €	
5.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	1,000.00 €	1,000.00 €	

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
6.	**STORMWATER DRAINAGE SYSTEM**					
6.1	**Package 4 (Block K, H, I)**					**4,350.00 €**
6.1.1	**Pipping**					
6.1.1.1	Supply and installation of PVC pipes for buried/embedded rainwater drainage network, installed in proper ditches, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the					
6.1.1.1.1	Ø 160 mm	m	20.00	15.00 €	300.00 €	
6.1.2	**Equipment and Accessories**					
6.1.2.1	Execution of a concrete manholes supported by a suitable gully cast iron covers, load class B125 to receive the same finishing of the floor, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans, detail drawings and construction supervision instructions, with the followina					
6.1.2.1.1	0.40x0.40	un	1	250.00 €	250.00 €	
6.1.2.2	Execution of a concrete manholes supported by a suitable recessed cast iron covers, load class B125 to receive the same finishing of the floor, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans, detail drawings and construction supervision instructions, with the following dimensions:					
6.1.2.2.1	0.60x0.60	un	1	300.00 €	300.00 €	
6.1.3	**Complementary Work**					
6.1.3.1	Construction work to support the implementation of wastewater networks, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	1,000.00 €	1,000.00 €	
6.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	500.00 €	500.00 €	
6.1.3.3	Evaluation, rehabilitation (if necessary), cleaning and maintenance works of existing networks to be maintained, including all materials and work necessary for their perfect execution.	gv	1	1,000.00 €	1,000.00 €	
6.1.4	**Final Work**					
6.1.4.1	Verification and testing of all network.	gv	1	500.00 €	500.00 €	
6.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	500.00 €	500.00 €	

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
7.	**FIREFIGHTING WATER SYSTEM**					
7.1	**Package 4 (Block K, H, I)**					**4,510.00 €**
7.1.1	**Pipping**					
7.1.1.1	Supply and installation of HDPE pipe, for Firefighting network, buried, including earthworks and installation, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
7.1.1.1.1	Ø 50 mm	m	8.50	20.00 €	170.00 €	
7.1.1.2	Supply and Installation of Galvanized steel pipe, for the Firefighting network, including bonding and branch accessories, supports and clamps with acoustic insulation, threaded or grooved, installed at sight, fixed by quick-mount clamps in galvanized iron attached to walls or ceilings, including opening and closure of notches, wall/floor/ceilings holes for pipe crossings, a first coat of painting anticorrosive, and two coats of colour finishing according legal standards, and remaining accessories necessary to the good functioning of the network, according the plans and construction supervision instruction, with the following diameters:					
7.1.1.2.1	Ø 50 mm	m	6.00	25.00 €	150.00 €	
7.1.2	**Equipment and Accessories**					
7.1.2.1	Supply and installation of Swing type fire hosereel, Model 99-N(19mm), to be installed in a closet with 180° opening door, predicted by the architecture, with reinforced PVC hose, with 30m length, 3 position nozzle: jet, fog and closure, including manual quick-release valve with manometer, axial bracket, tested and approved according EN 671-1:2012, remaining accessories and necessary works for a perfect execution of the task according construction supervision instructions.	un	2	720.00 €	1,440.00 €	
7.1.2.2	Reservoir for Firefighting					
7.1.3	**Complementary Work**					
7.1.3.1	Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	1,500.00 €	1,500.00 €	
7.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	250.00 €	250.00 €	
7.1.4	**Final Work**					
7.1.4.1	Verification, cleaning and testing of all network.	gv	1	500.00 €	500.00 €	
7.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	500.00 €	500.00 €	

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
	8 ELECTRICAL INSTALLATIONS					**24,505.00 €**
8.1	**BLOCK H**					**20,603.50 €**
	The Bill of Quantities, Specifications, Drawings and all other Contract documents are complementary to each other. **It is the responsibility of the Contractor to check the locations and quantities of the materials and equipment to be executed in accordance with the drawings.** **The unit rate of the materials and equipment shall be based on the Specification, all components as required and specified under each item concerned in the Specifications, Drawings, and all other Contract documents.**					
8.1.1	**Low Voltage Switchboard**					
8.1.1.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.1.2	Normal / Standby Switchboards:					
8.1.1.2.1	- S.H.1 (E)	Un	1	300.00 €	300.00 €	
8.1.1.2.2	- S.H.2 (E)	Un	1	250.00 €	250.00 €	
8.1.2	**Cabling**					
8.1.2.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as					
8.1.2.2	LV Distribution Cables (Indoor):					
8.1.2.2.1	- 5G4 mm² Cu/ XLPE/ PVC	ml	41	12.00 €	492.00 €	
8.1.3	**Lighting**					
8.1.3.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.3.2	Indoor Lighting:					
8.1.3.2.1	Luminaires:					
8.1.3.2.1.1	- L1	Un	8	20.00 €	160.00 €	
8.1.3.2.1.2	- L3.1	Un	14	20.00 €	280.00 €	
8.1.3.2.1.3	- L3.2	Un	4	22.00 €	88.00 €	
8.1.3.2.1.4	- L4.1	Un	4	40.00 €	160.00 €	
8.1.3.2.1.5	- L12	Un	28	20.00 €	560.00 €	
8.1.3.2.1.6	- L18.1	Un	10	20.00 €	200.00 €	
8.1.3.2.1.7	- L18.2	Un	2	22.00 €	44.00 €	
8.1.3.2.1.8	- L18.3	Un	2	25.00 €	50.00 €	
8.1.3.3	Lighting Command Devices					
8.1.3.3.1	- One way switch, surface mounting	Un	9	15.00 €	135.00 €	
8.1.3.3.2	- Double pole switch, surface mounting	Un	13	15.00 €	195.00 €	
8.1.3.3.3	- Two way switch, surface mounting	Un	8	15.00 €	120.00 €	
8.1.3.3.4	- Surface Mounting Movement Detector 360°	Un	22	20.00 €	440.00 €	
8.1.3.3.5	- Surface Mounting Presence Detector 360°	Un	9	20.00 €	180.00 €	
8.1.3.4	Flush and surface Mounting Boxes:					
8.1.3.4.1	Surface or Recessed mounting Connection Box	Un	56	2.00 €	112.00 €	
8.1.3.5	Electrical cables:					
8.1.3.5.1	Enclosed in a recessed or surface conduiting:					
8.1.3.5.1.1	- 2x 1.5 mm² Cu/ XLPE/ LSZH	ml	87	1.50 €	130.50 €	
8.1.3.5.1.2	- 3x 1,5 mm² Cu/ XLPE/ LSZH	ml	84	2.00 €	168.00 €	
8.1.3.5.1.3	- 3G 1.5 mm² Cu/ XLPE/ LSZH	ml	306	2.50 €	765.00 €	
8.1.3.5.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
8.1.3.5.2.1	- 3x 1,5 mm² Cu/ XLPE/ LSZH	ml	58	2.00 €	116.00 €	
8.1.3.5.2.2	- 3G 1.5 mm² Cu/ XLPE/ LSZH	ml	185	2.50 €	462.50 €	
8.1.3.6	Metric Rigid Conduit:					
8.1.3.6.1	Enclosed in a recessed or surface conduiting:					
8.1.3.6.1.1	- PEAD Ø 20 mm	ml	477	0.50 €	238.50 €	
8.1.4	**Emergency / Safety Lighting**					
8.1.4.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.4.2	Indoor Lighting:					
8.1.4.2.1	- S1 - maintained (60min Autonomy)	Un	2	50.00 €	100.00 €	
8.1.4.2.2	- S1 - not maintained (60min Autonomy)	Un	14	40.00 €	560.00 €	
8.1.4.2.3	- S2 - maintained (60min Autonomy)	Un	4	50.00 €	200.00 €	
8.1.4.3	Electrical cables:					
8.1.4.3.1	Enclosed in a recessed or surface conduiting:					
8.1.4.3.1.1	- 3G 1,5 mm² Cu/ XLPE/ LSZH	ml	33	2.00 €	66.00 €	
8.1.4.3.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
8.1.4.3.2.1	- 3G 1.5 mm² Cu/ XLPE/ LSZH	ml	65	2.50 €	162.50 €	
8.1.4.4	Metric Rigid Conduit:					
8.1.4.4.1	Enclosed in a recessed or surface conduiting:					
8.1.4.4.1.1	- PVC Ø 20 mm	ml	33	0.50 €	16.50 €	

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
	8 ELECTRICAL INSTALLATIONS					24,505.00 €
8.1.5	**General Purpose Power Outlet**					
8.1.5.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as					
8.1.5.2	Single Flush and Surface Mounting Devices - Normal/Standby Supply:					
8.1.5.2.1	- Surface Mounting Earthed Socket (BS Type) - 16A with cover IP44	Un	2	15.00 €	30.00 €	
8.1.5.2.2	- Surface mounting earth Socket (BS Type) - 16A IP44	Un	14	15.00 €	210.00 €	
8.1.5.2.3	- Flush Mounting Earthed Socket (BS Type) - 16A trunking	Un	26	15.00 €	390.00 €	
8.1.5.3	Double Flush and Surface Mounting Devices - Normal/Standby Supply:					
8.1.5.3.1	- Flush Mounting Earthed Socket (BS Type) - 16A trunking	Un	26	20.00 €	520.00 €	
8.1.5.8	Flush and surface Mounting Boxes:					
8.1.5.8.1	Surface or Recessed mounting Connection Box	Un	47	2.00 €	94.00 €	
8.1.5.8.2	Surface or Recessed mounting Terminal Box	Un	19	2.00 €	38.00 €	
8.1.5.9	Electrical cables:					
8.1.5.9.1	Enclosed in a recessed or surface conduiting:					
8.1.5.9.1.1	- 3G 2.5 mm² Cu/ XLPE/ LSZH	ml	566	2.00 €	1,132.00 €	
8.1.5.9.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
8.1.5.9.2.1	- 3G 2.5 mm² Cu/ XLPE/ LSZH	ml	422	2.00 €	844.00 €	
8.1.5.9.2.2	- 5G 2.5 mm² Cu/ XLPE/ LSZH	ml	53	2.50 €	132.50 €	
8.1.5.10	Metric Rigid Conduit:					
8.1.5.10.1	Enclosed in a recessed or surface conduiting:					
8.1.5.10.1.1	- PVC Ø 20 mm	ml	566	0.50 €	283.00 €	
8.1.6	**Cable tray, Trunking System and Conduits**					
8.1.6.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.6.2	Metalic perforated cable tray of side height 60 mm:					
8.1.6.2.1	Electrical Instalation:					
8.1.6.2.1.1	- 400 width, strip-galvanised	ml	55	40.00 €	2,200.00 €	
8.1.6.2.1.2	- 200 width, strip-galvanised	ml	75	20.00 €	1,500.00 €	
8.1.6.2.2	ICT Instalation:					
8.1.6.2.2.1	- 200 width, strip-galvanised	ml	55	20.00 €	1,100.00 €	
8.1.6.2.2.2	- 100 width, strip-galvanised	ml	67	15.00 €	1,005.00 €	
8.1.6.3	Distribution Cable-Trunkings:					
8.1.6.3.1	- Cable-Trunkings, with 110x50mm	ml	90	15.00 €	1,350.00 €	
8.1.6.4	Metric Rigid Conduit:					
8.1.6.4.1	Enclosed in a recessed or surface conduiting:					
8.1.6.4.1.1	- PVC Ø 25 mm	ml	47	0.50 €	23.50 €	
8.1.7	**Complementary Work**					
8.1.7.1	Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	Gv	1	1,000.00 €	1,000.00 €	
8.1.7.2	- Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	Gv	1	1,000.00 €	1,000.00 €	
8.1.8	**Final Work**					
8.1.8.1	- Verification, cleaning and testing of all network.	Gv	1	500.00 €	500.00 €	
8.1.8.2	- Elaboration of the pieces drawn according to the work executed.	Gv	1	500.00 €	500.00 €	
8.2	**BLOCK I**					3,901.50 €
	The Bill of Quantities, Specifications, Drawings and all other Contract documents are complementary to each other. **It is the responsibility of the Contractor to check the locations and quantities of the materials and equipment to be executed in accordance with the drawings.** **The unit rate of the materials and equipment shall be based on the Specification, all components as required and specified under each item concerned in the Specifications, Drawings, and all other Contract documents.**					

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
	8 ELECTRICAL INSTALLATIONS					24,505.00 €
8.2.1	**Low Voltage Switchboard**					
8.2.1.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.2.1.2	Normal / Standby Switchboards:					
8.2.1.2.1	- S.I.0 (E)	Un	1	300.00 €	300.00 €	
8.2.2	**Lighting**					
8.2.2.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.2.2.2	Indoor Lighting:					
8.2.2.2.1	Luminaires:					
8.2.2.2.1.1	- L9.1	Un	2	40.00 €	80.00 €	
8.2.2.2.1.2	- L15.1	Un	20	20.00 €	400.00 €	
8.2.2.2.1.3	- L18.3	Un	2	25.00 €	50.00 €	
8.2.2.2.1.4	- L25	Un	2	30.00 €	60.00 €	
8.2.2.3	Outdoor Lighting:					
8.2.2.3.1	Luminaires:					
8.2.2.3.1.1	- E1	Un	2	40.00 €	80.00 €	
8.2.2.3	Lighting Command Devices					
8.2.2.3.1	- Surface Mounting Movement Detector 180°	Un	22	20.00 €	440.00 €	
8.2.2.3.2	- Surface Mounting Movement Detector 360°	Un	2	30.00 €	60.00 €	
8.2.2.4	Flush and surface Mounting Boxes:					
8.2.2.4.1	Surface or Recessed mounting Connection Box	Un	27	2.00 €	54.00 €	
8.2.2.5	Electrical cables:					
8.2.2.5.1	Enclosed in a recessed or surface conduiting:					
8.2.2.5.1.1	- 3x 1.5 mm² Cu/ XLPE/ LSZH	ml	48	2.00 €	96.00 €	
8.2.2.5.1.2	- 3G 1,5 mm² Cu/ XLPE/ LSZH	ml	156	2.00 €	312.00 €	
8.2.2.6	Metric Rigid Conduit:					
8.2.2.6.1	Enclosed in a recessed or surface conduiting:					
8.2.2.6.1.1	- PEAD Ø 20 mm	ml	204	0.50 €	102.00 €	
8.2.3	**Emergency / Safety Lighting**					
8.2.3.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as					
8.2.3.2	Indoor Lighting:					
8.2.3.2.1	- S4 - not maintained (60min Autonomy)	Un	4	50.00 €	200.00 €	
8.2.3.3	Electrical cables:					
8.2.3.3.1	Enclosed in a recessed or surface conduiting:					
8.2.3.3.1.1	- 3G 1,5 mm² Cu/ XLPE/ LSZH	ml	6	2.00 €	12.00 €	
8.2.3.4	Metric Rigid Conduit:					
8.2.3.4.1	Enclosed in a recessed or surface conduiting:					
8.2.3.4.1.1	- PVC Ø 20 mm	ml	6	0.50 €	3.00 €	
8.2.4	**General Purpose Power Outlet**					
8.2.4.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.2.4.2	Single Flush and Surface Mounting Devices - Normal/Standby Supply:					
8.2.4.2.1	- Surface Mounting Earthed Socket (BS Type) - 16A with cover IP44	Un	1	15.00 €	15.00 €	
8.2.4.3	Electrical cables:					
8.2.4.3.1	Enclosed in a recessed or surface conduiting:					
8.2.4.3.1.1	- 3G 2.5 mm² Cu/ XLPE/ LSZH	ml	15	2.00 €	30.00 €	
8.2.4.4	Metric Rigid Conduit:					
8.2.4.4.1	Enclosed in a recessed or surface conduiting:					
8.2.4.4.1.1	- PVC Ø 20 mm	ml	15	0.50 €	7.50 €	
8.2.5	**Complementary Work**					
8.2.5.1	Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	Gv	1	600.00 €	600.00 €	
8.2.5.2	- Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	Gv	1	600.00 €	600.00 €	
8.2.6	**Final Work**					
8.2.6.2	- Verification, cleaning and testing of all network.	Gv	1	200.00 €	200.00 €	
8.2.6.2	- Elaboration of the pieces drawn according to the work executed.	Gv	1	200.00 €	200.00 €	
	TOTAL ELECTRICAL INSTALLATIONS					24,505.00 €

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
9.	**INFORMATION & COMMUNICATIONS TECHNOLOGY (ITC)**					
9.1	**BLOCK H + I**					**16,796.88 €**
	The Bill of Quantities, Specifications, Drawings and all other Contract documents are complementary to each other. **It is the responsibility of the Contractor to check the locations and quantities of the materials and equipment to be executed in accordance with the drawings.** **The unit rate of the materials and equipment shall be based on the Specification, all components as required and specified under each item concerned in the Specifications, Drawings, and all other Contract documents.**					
9.1.1	**TCP/IP Network**					
9.1.1.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
9.1.1.1.1	Building Telecommunications Racks, Boxes and Cabinets:					
9.1.1.1.1.1	- Building Entrance Terminal Box	Gv	2	1,200.00 €	2,400.00 €	
9.1.1.1.1.2	**- (Rack 3)**					
9.1.1.1.1.2.1	- Server Cabinet 12U's (Rack 19" A800xL600xP600 [mm]	Un	1	816.00 €	816.00 €	
9.1.1.1.1.2.2	- Optical Fiber Panel 12 SC/APC connector (OF arrival)	Un	1	540.00 €	540.00 €	
9.1.1.1.1.2.3	- Painel Coaxial (RG-CC Mirror)	Un	1	150.00 €	150.00 €	
9.1.1.1.1.2.4	- Patch Panel 1HU 24 RJ45 Cat 6A connector. (Distribution)	Un	1	306.00 €	306.00 €	
9.1.1.1.1.2.5	- Outlet Rackmount Power Strip 220V with a breaker.	Un	1	105.60 €	105.60 €	
9.1.1.1.1.2.6	- Including, set of 2 fans with thermostat, Fixed Shelf, Cable Management, Rings, and all required accessories and equipments necessary for its perfect assembly and operation.	Un	1	162.00 €	162.00 €	
9.1.1.1.2	Flush and Surface Mounting Devices:					
9.1.1.1.2.1	- Data outlet 2xRJ45 CAT 6A - Trunkung System assembly	Un	8	49.56 €	396.48 €	
9.1.1.1.3	Electrical cables:					
9.1.1.1.3.1	Enclosed in a recessed or surface conduiting:					
9.1.1.1.3.1.1	- U/UTP Category 6A Copper LSZH	ml	50	1.32 €	66.00 €	
9.1.1.1.3.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
9.1.1.1.3.2.1	- U/UTP Cat 6 LSZH	ml	300	1.92 €	576.00 €	
9.1.1.1.4	Patch cords.					
9.1.1.1.4.1	- U/UTP Category 6A Copper 1,0mt LSZH	Un	24	6.00 €	144.00 €	
9.1.1.1.4.2	- U/UTP Category 6A Copper 3mt LSZH	Un	24	9.60 €	230.40 €	
9.1.1.1.4.3	- FO 50/125 OM3 LSZH	Un	2	55.20 €	110.40 €	
9.1.1.1.5	Metric Rigid Conduit:					
9.1.1.1.5.1	Enclosed in a recessed or surface conduiting:					
9.1.1.1.5.1.1	- PVC Ø 25 mm	ml	40	0.96 €	38.40 €	
9.1.1.1.6	Others:					
9.1.1.1.6.1	- Engineering, System Programming, including System Testing, Commissioning and Training.	Gv	1	960.00 €	960.00 €	
9.1.1.1.6.2	- Connections, connectorizations and labeling.	Gv	1	408.00 €	408.00 €	
9.1.2	**Fire Detection System**					
9.1.2.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
9.1.2.1.1	Fire Detection Devices:					
9.1.2.1.1.1	- Repeater alarm panel sounder/beacons Orange	Un	1	576.00 €	576.00 €	
9.1.2.1.1.2	- Manual call points	Un	2	210.00 €	420.00 €	
9.1.2.1.1.3	- Optical smoke detector including detector base	Un	14	54.00 €	756.00 €	
9.1.2.1.2	Electrical cables:					
9.1.2.1.2.1	Enclosed in a recessed or surface conduiting:					
9.1.2.1.2.1.1	- JE-H(st)H 2x2x0,8mm²	ml	120	2.64 €	316.80 €	
9.1.2.1.2.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
9.1.2.1.2.2.1	- JE-H(st)H 2x2x0,8mm²	ml	120	3.84 €	460.80 €	
9.1.2.1.3	Metric Rigid Conduit:					
9.1.2.1.3.1	Enclosed in a recessed or surface conduiting:					
9.1.2.1.3.1.1	- PVC Ø 20 mm	ml	100	0.78 €	78.00 €	
9.1.2.1.4	Others:					
9.1.2.1.4.1	- Engineering, System Programming, including System Testing, Commissioning and Training.	Gv	1	2,160.00 €	2,160.00 €	
9.1.3	**Complementary Work**					
9.1.3.1	Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	Gv	1	1,200.00 €	1,200.00 €	
9.1.3.1.1	- Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	Gv	1	1.200.00 €	1,200.00 €	
9.1.4	**Final Work**					
9.1.4.1	- Verification, cleaning and testing of all network.	Gv	1	1,200.00 €	1,200.00 €	
9.1.4.2	- Elaboration of the pieces drawn according to the work executed.	Gv	1	1.020.00 €	1,020.00 €	
TOTAL ITC						**16,796.88 €**

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
10	**Ventilation and Air Conditioning (VAC)**					
	BLOCK H					**19,130.00 €**
10.1	**Ventilation and Air Conditioning (VAC)**					
10.1.1	**Ducts and Casings (Section 3/4/6)**					
10.1.1.1	Supply and installation of spiral galvanized steel ductwork and fittings including hangers and washers covered in an approved vapour seal, complete with duct cladding, volume control dampers, fire dampers, supports and all required accessories as per technical specifications and drawings.					
10.1.1.1.1	- Spiral galvanized steel ductwork without insulation					
10.1.1.1.1.1	- DN 125	ml	1.20	50.00 €	60.00 €	
10.1.2	**VAC Fans (Section 8)**					
10.1.2.1	Supply and installation of exhaust and ceiling fans complete with fittings, flexible connectors, spring mount vibration isolators, frequency inverter, protection against corrosion and all required accessories as specified in schedules of equipment, detailed drawings and technical specifications.					
10.1.2.1.1	Exhaust wall mounted Fan					
10.1.2.1.1.1	- EF1 - S&P Silent 200	Un	9.00	100.00 €	900.00 €	
10.1.2.1.2	Ceiling fans					
10.1.2.1.2.1	- CF1 - Ceiling fan - S&P HTB 75 RC	Un	6.00	100.00 €	600.00 €	
10.1.2.1.2.2	- CF2 - Ceiling fan - S&P HTB 90 RC	Un	2.00	120.00 €	240.00 €	
10.1.2.1.2.3	- CF3 - Ceiling fan - S&P HTB 150 RC	Un	2.00	150.00 €	300.00 €	
10.1.3	**Air Outlets And Inlets (Section 10)**					
10.1.3.1	Supply and installation of exhaust air louvers complete with insect screen and gravity shutters including connections to ductwork and all required accessories as per technical specifications and drawings.					
10.1.3.1.1	- EL1 - 200x200	Un	9.00	90.00 €	810.00 €	
10.1.4	**Split Air Conditioners (Section 11)**					
10.1.4.1	Supply and installation of outdoor units, including integral controls, protection device, protection against corrosion, complete with condensate piping, as per technical specifications and drawings.					
10.1.4.1.1	CDU1 - LGS09EQ.UA3	Un	2.00	600.00 €	1,200.00 €	
10.1.4.1.2	CDU2 - LGS12EQ.UA3	Un	2.00	700.00 €	1,400.00 €	
10.1.4.1.3	CDU3 - LGS18EQ.UL2	Un	4.00	800.00 €	3,200.00 €	
10.1.4.2	Supply and installation of indoor units, including wired remote control, accessories, supports as per technical specifications and drawings					
10.1.4.2.1	FCU1 - LGS09EQ.NSJ	Un	2.00	300.00 €	600.00 €	
10.1.4.2.2	FCU2 - LGS12EQ.NSJ	Un	2.00	300.00 €	600.00 €	
10.1.4.2.3	FCU3 - LGS18EQ.NSK	Un	4.00	400.00 €	1,600.00 €	
10.1.5	**HVAC Testing, Adjusting and Balancing (Section 13)**					
10.1.5.1	Final tests of the installation including balancing, adjusting, commissioning and handling to client complete operational systems and equipment as per technical specifications and drawings. installation	Gv	1.00	1,500.00 €	1,500.00 €	
10.2	**Hydraulic Installations VAC**					
10.2.1	**Refrigerant Piping (Section 14)**					
10.2.1.1	Supply and installation of refrigeration tube - EN 12735-1, copper tube designed specifically for refrigeration and air conditioning use and accordingly cleaned, nitrogen-purged and capped, complete with all necessary fittings, supports and all required accessories as technical specifications and drawings.					
10.2.1.1.1	Copper with thermal insulation and protection exposed pipe by aluminium cladding					
10.2.1.1.1.1	- Liq Ø6.4 mm / Gas Ø9.5 mm	ml	14.80	50.00 €	740.00 €	
10.2.1.1.1.2	- Liq Ø6.4 mm / Gas Ø12.7 mm	ml	18.00	60.00 €	1,080.00 €	
10.2.1.1.2	Supply and installation of drainage pipe work complete with all necessary fittings, supports and accessories within building as per technical specifications and drawings.	Gv	1.00	300.00 €	300.00 €	
10.3	**General**					
10.3.1	Identification for VAC Ducting Piping and Equipment.	Gv	1.00	500.00 €	500.00 €	
10.3.2	Painting, Tagging and Labelling of entire mechanical system as specified.	Gv	1.00	500.00 €	500.00 €	
10.3.3	Maintenance for two years (guarantee period), including supply of all needed spare parts during the year.	Gv	1.00	2,000.00 €	2,000.00 €	
10.3.4	Transport of Equipment VAC	Gv	1.00	1,000.00 €	1,000.00 €	

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
13	**FIRE SAFETY**					**2,175.00 €**
13.1	**BLOCK H**					**1,995.00 €**
13.1.1	**EMERGENCY SIGNS**					
13.1.1.1	Application of emergency signs, in accordance with the fire safety project, with the following dimensions:					
13.1.1.1.1	**200 x 200 mm:**					
13.1.1.1.1.1	S1 - Fire extinguisher	un	5.0	60.00 €	300.00 €	
13.1.1.1.2	**150 x 200 mm:**					
13.1.1.1.2.1	S2 - Fire Alarm	un	2.0	45.00 €	90.00 €	
13.1.1.1.2.2	S4 - Fire Hose	un	2.0	45.00 €	90.00 €	
13.1.1.1.2.3	S5 - Fire extinguisher Instructions for use, Carbon Dioxide	un	1.0	45.00 €	45.00 €	
13.1.1.1.2.4	S6 - Fire extinguisher Instructions for use, ABC Powder	un	4.0	45.00 €	180.00 €	
13.1.1.1.3	**300 x 300 mm:**					
13.1.1.1.3.1	P1 - Warning, Elecric switch	un	2.0	75.00 €	150.00 €	
13.1.1.1.4	PE - Application of Escape Plan and simplified instructions, in accordance with the fire safety project.	un	2.0	75.00 €	150.00 €	
13.1.2	**MEANS OF FIRST INTERVENTION**					
13.1.2.1	**EXTINGUISHERS**					
13.1.2.1.1	Installation of portable fire extinguishers with the following characteristics:					
13.1.2.1.1.1	ABC Powder, 6kg	un	4.0	210.00 €	840.00 €	
13.1.2.1.1.2	Carbon Dioxide (CO_2), 2kg	un	1.0	150.00 €	150.00 €	
13.2	**BLOCK I**					**180.00 €**
13.2.1	**EMERGENCY SIGNS**					
13.2.1.1	Application of emergency signs, in accordance with the fire safety project, with the following dimensions:					
13.2.1.1.1	**300 x 300 mm:**					
13.2.1.1.1.1	P1 - Warning, Elecric switch	un	1.0	180.00 €	180.00 €	

AGENZIA ITALIANA PER LA COOPERAZIONE ALLO SVILUPPO

Original

REHABILITATION OF THE SAUDI MATERNITY HOSPITAL
KASSALA HEALTH CITADEL - SUDAN
BOQ - BILL OF QUANTITY
PACKAGE 6- IPD (WARDS 01) | BLOCK D

CODE	DISCIPLINE	VALUE
1	Architectural	143,519.35 €
2	STRUCTURES	21,009.76 €
3	WATER SUPPLY SYSTEM	4,986.15 €
4	WASTEWATER DRAINAGE SYSTEM	12,853.00 €
5	STORMWATER DRAINAGE SYSTEM	6,230.00 €
6	FIREFIGHTING WATER SYSTEM	6,665.10 €
7	ELECTRICAL INSTALLATIONS	29,853.00 €
8	INFORMATION & COMMUNICATIONS TECHNOLOGY (ITC)	61,943.88 €
9	AIR CONDITIONING AND VENTILATION	34,532.00 €
10	MEDICAL GASES	0.00 €
11	FIRE SAFTY	2,640.00 €
TOTAL		**324,232.24 €**

AGENZIA ITALIANA PER LA COOPERAZIONE ALLO SVILUPPO

Project: Rehabilitation of the Saudi Maternity Hospital Location: Kassala Health Citadel, Sudan

Date: 31 January 2020 UNOPS

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BILL OF QUANTITIES-PACK 6-ARC

NOTES:
1. The articles include all the preparatory and basic work, including all the materials and accessories, required for their execution and perfect finish.
2. All materials to be demolished or removed shall be considered as reusable and all necessary actions must be taken for their perfect conservation and placed in storage or in the successful tenderer's outlet, all according to the indications of the inspection.

*a.w-all works

**n.a- non applicable

Grand Total-PACK 6-ARC 143,519.35

Art°	Description of works	Un.	Quant.	Unit Price	Total
CHAPTER A - CONSTRUCTION SITE					
1.	Construction site assembly and disassembly, including plate construction site identifier and fencing; provisional installations namely for the developer; supervision; materials warehouse; equipment and tools; facilities for personnel services; sanitary facilities; provisional networks	a.w	1	2,000.00	2,000.00
2.	Implementation and development of the health,safety and security plan	a.w	1	1,500.00	1,500.00
3.	Implementation and development of the prevention, construction and demolition waste management	a.w	1	2,000.00	2,000.00
4.	Execution of the final cleaning of the work, including all the necessary work and removal from the contractor's deposit of surplus products	a.w	1	1,000.00	1,000.00
CHAPTER B - DEMOLITIONS					
1.	Demolition element by element from the roof, of all the elements proposed for demolition, including removal single element with temporary shoring if necessary, removal and classification of debris and waste, for subsequent transport to the authorised outlet, all necessary work, materials and equipment.	a.w	1	400.00	400.00
2.	Execution of all necessary survey work/ disassembly of water installations and equipment, existing sewers, electrics, telephone, etc., including loading, carriage to and unloading of all cargoes materials.	a.w	1	250.00	250.00
3.	Demolition of existing brick walls, according to demolition plan, including removal of products from demolition, to dumping ground, to any distance	a.w	1	400.00	400.00
4.	Demolition of existing indoor and outdoor doors and windows according to demolition plan, including removal of products from demolition, to dumping ground, to any distance.	a.w	1	150.00	150.00
5.	Execution of demolition of existing indoor floors of ceramic tiles, for subsequent application of new coatings including removal of products from demolition, to dumping ground, at any distance.	a.w	1	150.00	150.00
6.	Execution of removal of existing bathroom fittings, including removal of products from demolition, to dumping ground, at any distance.	a.w	1	150.00	150.00
7.	Existing walls to be demosidhed according to demolition plan	m2	198.23	0.50	99.12
	End of Chapter B				
CHAPTER C - GENERAL CIVIL AND INFRASTRUCTURE CONSTRUCTION					
1	WALLS				
1.1	Exterior Walls				
1.1.1	P1 -nominated on the project as Skin Wall; baked terracota pieces (please see detail on shett A.05.02)	m2	39.83	50.00	1,991.50
1	WALLS				
1.1	Exterior Walls				
1.1.2	P2- nominated on the project as Thermal Block; 20cm thermal clay brick with massive btick exterior covering (please see detail on shett A.05.02)	m2	231.07	35.00	8,087.45
1.2	Interior Walls				
1.2.1	P3-Internal mineral insulation liner with plasterboard covering (please see detail on shett A.05.02)	m2	n.a	18.00	
1.2.2	P4- Interior plasterboard partition (please see detail on shett A.05.02)	m2	n.a	25.00	
1.2.3	P5- 11 cm brick double plastered (please see detail on shett A.05.02)	m2	85.78	27.00	2,316.06
1.2.4	P6- 15cm brick double plastered (please see detail on shett A.05.02)	m2	n.a	30.00	
1.2.5	P7- 20cm brick double plastered (please see detail on shett A.05.02)	m2	65.32	30.00	1,959.60
2	FENCE				
2.1	Proposed:nominated on the project as Skin Wall; with baked terracota pieces (please see sheet number: A.05.03- Constructive Details,Walls Fence)	m/l	n.a	70.00	
2.2	Future Expansion: nominated on the project as Skin Wall; with baked terracota pieces (please see sheet number: A.05.03- Constructive Details,Walls Fence)	m/l	n.a	50.00	
3.	COATINGS				
3.1	Coatings Interior Walls				
3.2.1	W2- 0.15x0.15m white ceramic tiles till 2.10m height	m2	95.78	20.00	1,915.60
3.2	Coatings Interior Flooring				
3.2.1	F2- 0.30x0.30m Porcelanic tiles,Anti-split, Grey colored	m2	112.83	20.00	2,256.60
3.2.2	F2- Baseboard	m/l	n.a	20.00	
3.2.3	F3- 0.60x0.60m Porcelanic tiles, Grey colored	m2	n.a	20.00	
3.2.4	F3- Baseboard	m/l	n.a	6.00	
3.2.5	F4- 0.60x0.60m Porcelanic tiles, Grey colored	m2	604.45	20.00	12,089.00
3.2.6	F4- Baseboard	m/l	n.a	6.00	
3.2.7	F5-0.60x0.60m Porcelanic tiles,Yellow colored	m2	495.13	20.00	9,902.60
3.2.8	F5- Baseboard	m/l	362.51	6.00	2,175.06

Continuation of chapter C

3	COATINGS				
3.2	Coatings Interior Flooring				
3.2.9	F6-0.60x0.60m Porcelanic tiles, Purple colored	m2	n.a	20.00	
3.2.10	F6- Baseboard	m/l	n.a	6.00	
3.2.11	F7-0.60x0.60m Porcelanic tiles, Blue colored	m2	63.24	22.00	1,391.28
3.2.12	F7- Baseboard	m/l	69.56	6.00	417.36
3.2.13	F8-0.60x0.60m Porcelanic tiles, Blue colored	m2	n.a	22.00	
3.2.14	F8- Baseboard	m/l	n.a	6.00	
4	CEILINGS				
4.1	Interior Ceilings				
4.1.1	Supply and execution of false interior ceiling: waterproofing plasterboard to be painted with paint (W1) including transport, unloading, support structure, backstrips, bars and reinforcements, relapses, opening of negatives for lighting, all complementary materials, works and accessories	m2	n.a	15.00	
5	INTERIOR PAVING				
5.1	Floor levelling with screed levelling before the applyance of new coatings	a.w	1	500.00	500.00
6	PAINTINGS				
6.1	Exterior Paintings				
6.1.1	E2- "terracota" acrylic paint (RAL colour 2013)	m2	1387.87	4.00	5,551.48
6.1.2	E3 -"concrete grey" acrylic paint (RAL colour 7023)	m2	396.29	4.00	1,585.16
6.1.3	E4-"pure white" poliuretane paint for metalic structure (RAL colour 9010)	m2	n.a	4.00	
6.2	Interior Paintings				
6.2.1	W1-Washable acrylic white paint	m2	257.92	4.00	1,031.68
7	WOODWORK				
7.1	A1:MDF 20mm WITH HPL; 3,40 x 0,70 x 1,10m	un	n.a	1,000.00	
7.2	A2:MDF 20mm WITH HPL; 1,20 x 0,70 x 1,10m	un	n.a	480.00	
7.3	A3:MDF 20mm WITH HPL; 1,10 x 0,70 x 1,10m)+(2,50 x 0,70 x 1,10m)	un	n.a	1,800.00	
7.4	A4:MDF 20mm WITH HPL; 2,10 x 0,70 x 1,10m	un	n.a	800.00	
7.5	A5: MDF 20mm WITH HPL; 2,55 x 0,70 x 1,10m	un	n.a	900.00	
7.6	B1: MDF 20mm WITH HPL ;1,65 x 0,60 x 0,90m	un	n.a	600.00	
7.7	B1': MDF 20mm WITH HPL; 1,65 x 0,35 x 0,60m	un	n.a	300.00	
7.8	B2: MDF 20mm WITH HPL; 2,15 x 0,60 x 0,90m	un	n.a	750.00	
7.9	A3':MDF 20mm WITH HPL; 2,5 x 0,70 x 1,10m)+(1,10 x 0,70 x 1,10m)	un	n.a	1,800.00	

Continuation of chapter C

7	WOODWORK				
7.10	B2': MDF 20mm WITH HPL; 2,15 x 0,35 x 0,60m	un	n.a	350.00	
7.11	B3: MDF 20mm WITH HPL; 1,90 x 0,60 x 0,90m	un	n.a	700.00	
7.12	B3':MDF 20mm WITH HPL; 1,90 x 0,35 x 0,60m	un	n.a	300.00	
7.13	B4: MDF 20mm WITH HPL; 2,55 x 0,60 x 0,90m	un	n.a	900.00	
7.14	B4': MDF 20mm WITH HPL;2,55 x 0,35 x 0,60m	un	n.a	400.00	
7.15	B5: MDF 20mm WITH HPL; 1.80 x 0,60 x 0,90m	un	n.a	700.00	
7.16	B6: MDF 20mm WITH HPL; 1.50 x 0,60 x 0,90m	un	n.a	600.00	
7.17	C1: MDF 30mm WITH HPL; 1,65 x 0,60 x 0,75m	un	n.a	400.00	
7.18	C2: MDF 30mm WITH HPL; 1,70 x 0,60 x 0,75m	un	n.a	400.00	
7.19	C3: MDF 30mm WITH HPL; 2,20 x 0,60 x 0,75m	un	n.a	500.00	
7.20	C4:MDF 30mm WITH HPL; 2,40 x 0,60 x 0,75m	un	n.a	550.00	
7.21	C5: MDF 30mm WITH HPL;2,10 x 0,60 x 0,75m	un	n.a	500.00	
7.22	C6: MDF 30mm WITH HPL;1,90 x 0,60 x 0,75m	un	n.a	450.00	
7.23	D1: MDF 50mm WITH HPL;4,95 x 0,70 x 0,75m	un	n.a	950.00	
7.24	D2: MDF 50mm WITH HPL,1,70 x 0,70 x 0,75m	un	n.a	350.00	

Original

8	DOORS				
8.1	Exterior Doors				
8.1.1	**G.1-** Double swing gate with fixed lateral sashes / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047" (dim. 4,22x2,10m). All accessories included.	un	n.a	850.00	
8.1.2	**G.2-** Double swing gate with fixed lateral sashes / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047" (dim. 2,40x2,10m). All accessories included.	un	1	600.00	600.00
8.1.3	**G.3-** Single swing gate with 1 fixed lateral sash / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 1,62x2,10m). All accessories included.	un	n.a	500.00	
8.1.4	**G.4-** Double swing gate / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 1,65x2,10m). All accessories included.	un	n.a	550.00	
8.1.5	**G.5-** Double swing gate with fixed lateral sashes / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 3,54x2,10m). All accessories included	un	n.a	750.00	
8.1.6	**G.6-** Single swing gate with 1 fixed lateral sash / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 2,00x2,10m). All accessories included.	un	n.a	550.00	
8.1.7	**G.6-** Single swing gate with 1 fixed lateral sash / tubular galvanized steel gate / polyester thermosetting powder coating in "light grey RAL 7047"(dim. 1,50x2,10m). All accessories included.	un	n.a	500.00	
8.2	Interior Doors				
8.2.1	**D.1-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,70x2,10m). Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,000.00	
8.2.2	**D.2-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,80x2,10m). Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	16	1,000.00	16,000.00
8.2.3	**D.3-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,90x2,10m). Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	2	1,000.00	2,000.00
8.2.4	**D.4-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,80x2,70m). Upper transom with a boom hung sash / 5+ 5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,200.00	
8.2.5	**D.5-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 0,85x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	4	1,200.00	4,800.00
8.2.6	**D.6-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 1,00x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,200.00	
8.2.7	**D.7-** Single swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 1,10x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	20	1,250.00	25,000.00
8.2.8	**D.8-** Double swing door / MDF or plywood / thermal laminate HPL "Polyrey G012 GRIS" with kick board in stainless steel (dim. 1,60x2,70m). Upper transom with a boom hung sash / 5+5mm laminated clear glass. Panic bar in stainless steel. All accessories included.	un	n.a	1,500.00	
8.2.9	**D.9-** Hermec sliding door / Hermetic system class 4, according UNI EN 12207 "Grupsa HS-201" / sheet of stainless steel (dim. 1,40x2,10m). No handle, automatic opening system. All accessories included.	un	n.a	1,400.00	
8.2.10	**D.10-** Single swing door / MDF or plywood / thermal laminate HPL "light grey RAL 7047" with a kick board in stainless steel (dim. 1,00x3,10m). Upper transom with a fixed sash / 5+5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,500.00	
8.2.11	**D.11-** Double swing door / MDF or plywood / thermal laminate HPL "light grey RAL 7047" with a kick board in stainless (dim. 1,50x3,10m). Upper transom with a fixed sash / 5+ 5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,900.00	
8.2.12	**D.11-** Double swing door / MDF or plywood / thermal laminate HPL "light grey RAL 7047" with a kick board in stainless (dim. 1,60x3,10m). Upper transom with a fixed sash / 5+ 5mm laminated clear glass. Handle in U-shaped latch and key, in stainless steel. All accessories included.	un	n.a	1,900.00	

8.3	Technical cabinets				
8.3.1	**TC.1-** Technical cabinet with double swing door / MDF or plywood / thermal laminate HPL white " RAL 9010" (dim. 1,20x2,10). With key / no handle. All accessories included.	un	n.a	700.00	
8.3.2	**TC.2-** Technical cabinet with double swing door / Galvenized steel/ painted "light grey RAL 7047" (dim. 1,20x2,10). With key / no handle. All accessories included.	un	n.a	500.00	
8.3.3	**TC.3-** Technical cabinet with single door / MDF or plywood/ thermal laminate HPL "white RAL 9010" (dim. 0,60x2,10). With key / no handle. All accessories included.	un	n.a	350.00	
8.3.4	**TC.4-** Technical cabinet with double swing door / Galvenized steel/ painted "light grey RAL 7047" (dim. 1,60x2,10). With key / no handle. All accessories included.	un	2	700.00	1,400.00
8.3.5	**TC.5-** Technical cabinet with double swing door /MDF or plywood/thermolaminated "RAL 9010"	un	n.a	800.00	
9	WINDOWS				
9.1	Interior Windows				
9.1.1	**W.1-** Slide and fixed window sashes / Anodized aluminium / Laminated 5+ 5mm clear glass (dim. 3,00x1,20). All accessories included.	un	n.a	450.00	
9.1.2	**W.2-** Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 2,25x1,50m). All accessories included.	un	14	420.00	5,880.00
9.1.3	**W.3-** Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,00x1,40m). All accessories included.	un	n.a	175.00	
9.1.4	**W.4-** Boom hung window sash / Anodized aluminium / Laminated 5+5mm clear glass (dim. 0,60x1,50m). All accessories included.	un	2	115.00	230.00
9.1.5	**W.5-** Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,50x2,00m). All accessories included.	un	2	375.00	750.00
9.1.6	**W.6-** Boom hung window sash / Anodized aluminium / Laminated 5+5mm clear glass (dim. 0,75x1,50m). All accessories included.	un	n.a	140.00	
9.1.7	**W.7-** Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,50x1,50m). All accessories included.	un	n.a	280.00	
9.1.8	**W.8-** Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,50x1,50m). All accessories included.	un	2	280.00	560.00
9.1.9	**W.9-** Slide window sashes / Anodized aluminium / Laminated 5+5mm clear glass (dim. 1,00x1,30m). All accessories included.	un	4	160.00	640.00
9.1.10	**W.10-** Fixed interior window / Anodized aluminium frame / Laminated 5+5mm clear glass (dim. 1,20x1,10m). All accessories included.	un	n.a	165.00	
9.1.11	**W.11-** Fixed interior window / Anodized aluminium frame / Laminated 5+5mm clear glass (dim. 2,20x1,10m). All accessories included.	un	n.a	300.00	
9.2	Shadding				
9.2.1	**S.1-** Existing shutters to be relocated in the west and south exposed windows (dim. 1,50x1,20m). All accessories included.	un	n.a	225.00	
9.3	Window Sill				
9.3.1	Existing Pre-fabricated concrete window sill (same width as the window) to be relocated	un	1	50.00	50.00
10	CANOPY				
10.1	Sandwich Roof Panels				
10.1.1	5 Ribs profiled outer sheet, exterior coating in white paint with good UV resistance (RAL 9010), core in Mineral wool with 80 mm thickness , interior coating: polymer coating resistant to mould (RAL 9010), Fire performance according to TS EN 13501-1,A2-s1	m2	52.56	50.00	2,628.00
10.2	Downspouts				
10.2.1	Metal downspouts painted in white with good UV resistance (RAL 9010) all joints and connections included	m/l	91.8	5.00	459.00
10.3	Gutters				
10.3.1	White Aluminium gutters, all joints included. Cover of the gutter with a lacquered (RAL 9010) metalic sheet with 48 cm high (please see detail on A.05.02 Walls and Gutters) held in place with metal clamps.	m/l	n.a	8.00	
10.4	Slab (Block D, washrooms patients				
10.4.1	Apliance of sealer/primer on dry slabs before the apliance of the asphalt membrane by the use of torch (on all the slab faces)	m2	74.75	80.00	5,980.00

11	VARIOUS				
11.1	Supply and placement of break-proof mirrors placed complanarly with the tile, including transportation, discharge, fixing accessories, tapes and all materials and complementary accessories. Mirror: 1,2m height with variable lenght	m2	10.44	60.00	626.40
CHAPTER D - INSTALLATION AND EQUIPMENT OF WATER AND SEWAGE SYSTEM					
1.	SANITARY EQUIPMENT				
1.1	Supply and laying of ceramic sanitary ware white glazed including transport, unloading, fastenings and connections, seals and all complementary materials, works and accessories	a.w	1	500.00	500.00
1.2	Toilets	un	2	500.00	1,000.00
1.3	Disabled Toilets	un	2	1,000.00	2,000.00
1.4	Disabled Toilets Bars kits	un	2	500.00	1,000.00
1.5	Squating Toilet	un	8	500.00	4,000.00
1.6	Basin white glazed. dimensions: 45*35	un	n.a	350.00	
1.7	Basin white glazed. dimensions: 60*45	un	8	350.00	2,800.00
1.8	Shower Kit	un	8	300.00	2,400.00
1.9	Drain	un	8	50.00	400.00
1.10	Foot washing bathtub	un	n.a	100.00	
1.11	Kitchen Sink	un	n.a	300.00	
1.12	Scrub Basin in stainless steel	un	n.a	2,000.00	
1.13	CSSD Basin	un	n.a	2,500.00	
1.14	Soiled Tray	un	1	100.00	100.00
CHAPTER E - LANDSCAPING					
10.1	Paving				
10.1.1	EF1-Resistent concrete pieces above a compacted pavement (vehicle road)	m2	n.a	35.00	
10.1.2	EF2-Concrete pieces (pedestrian sidewalk)	m2	n.a	35.00	
10.1.3	EF3-Compacted gravel	m2	30 80	8 00	246 40
10.1.4	EF4-Earth and humus to plant resistant type grass	m2	n.a	3.00	

10.1.5	Smoothed concrete floor with a siloxane sealer (exterior corridor)	m2	n.a	35.00	
10.2	Forestation				
10.2.1	New trees (local species to be defined)	un	2.00	100.00	200 00
10.2.1	New bushes (local species to be defined)	m/l	n.a	30.00	
	Total for PACK 6-ARC				143,510.35

End of BoQ_Saudy Maternity Hospital_ 31 January 2020

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
3	**STRUCTURES**					
3.1	**BLOCK D**					**21.009,76 €**
3.1.1	**EARTH-WORKS**					
3.1.1.1	**Excavation**					
3.1.1.1.1	Excavation on land of any nature in order to obtain project levels, including loading and transport of surplus material to the dump, eventual bracing, pumping of the tributary water to the excavation, regularization of the bottom of the box and replacement of land whenever necessary, all executed in order to obtain the levels indicated in the design.	m3	32.6	6.00 €	195.62 €	
3.1.1.2	**Excavation for foundations**					
3.1.1.1.2	Excavation on land of any nature for the implementation of foundations elements, including loading and transport of surplus material to the dump, eventual bracing, pumping of the tributary water to the excavation, regularization of the bottom of the box and replacement of land whenever necessary, all executed in order to obtain the levels indicated in the design.	m3	43.9	6.00 €	263.47 €	
3.1.2	**CONCRETE**					
3.1.2.1	**Blinding concrete**					
3.1.2.1.1	Concrete C16/20, for regularization of foudations, including supply, transport, placement, compaction and curing, according to the design.	m3	1.5	130.00 €	188.76 €	
3.1.2.1.2	Concrete C16/20, for rfoundation well, including supply, transport, placement, compaction and curing, according to the design. Note: For the quantification of the concrete in foundation pits (and the respective excavation) it was considered that the soil with the appropriate characteristics to support the projected structures is 3m deep, measured in relation to the level of the pavement. This assumption must be verified on site.	m3	28.2	130.00 €	3,660.80 €	
3.1.3	**REINFORCED CONCRETE**					
3.1.3.1	**Foundations**					
3.1.3.1.1	Reinforced concrete in Footing Standard grey concrete C25/30, including supply, transport, placement, compaction, curing and incorporation of water-repellent, according to the design. Reinforcement in A500 steel, including supply, transport, folding, cutting, assembly, anchorages, splicing, scrap and laying, according to the design. Formwork for concrete, in metal or wood molds, without defects, including transport, shoring, oil extraction and subsequent disassembly, according to the design.	m3	4.6	280.00 €	1,274.00 €	
3.1.3.1.2	Reinforced concrete in Locking Beams Standard grey concrete C25/30, including supply, transport, placement, compaction, curing and incorporation of water-repellent, according to the design. Reinforcement in A500 steel, including supply, transport, folding, cutting, assembly, anchorages, splicing, scrap and laying, according to the design. Formwork for concrete, in metal or wood molds, without defects, including transport, shoring, oil extraction and subsequent disassembly, according to the design.	m3	5.2	350.00 €	1,835.05 €	
3.1.3.2	**Structure above ground**					
3.1.3.2.1	Reinforced concrete in Columns Standard grey concrete C25/30, including supply, transport, placement, compaction, curing and incorporation of water-repellent, according to the design. Reinforcement in A500 steel, including supply, transport, folding, cutting, assembly, anchorages, splicing, scrap and laying, according to the design. Formwork for concrete, in metal or wood molds, without defects, including transport, shoring, oil extraction and subsequent disassembly, according to the design.	m3	1.6	380.00 €	598.50 €	
3.1.3.2.2	Reinforced concrete in Slabs Standard grey concrete C25/30, including supply, transport, placement, compaction, curing and incorporation of water-repellent, according to the design. Reinforcement in A500 steel, including supply, transport, folding, cutting, assembly, anchorages, splicing, scrap and laying, according to the design. Formwork for concrete, in metal or wood molds, without defects, including transport, shoring, oil extraction and subsequent disassembly, according to the design.	m3	10.2	350.00 €	3,582.95 €	

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
3	**STRUCTURES**					
3.1.3.2.3	Reinforced concrete in Beams Standard grey concrete C25/30, including supply, transport, placement, compaction, curing and incorporation of water-repellent, according to the design. Reinforcement in A500 steel, including supply, transport, folding, cutting, assembly, anchorages, splicing, scrap and laying, according to the design. Formwork for concrete, in metal or wood molds, without defects, including transport, shoring, oil extraction and subsequent disassembly, according to the design.	m3	8.9	350.00 €	3,112.90 €	
3.1.4	**OTHER SLABS**					
3.1.4.1	Ground Floor Slab Ground floor consisting of a concrete slab C25/30, 0,15m thick, including surface hardener, top and bottom welded reinforcement mesh, PVC membrane with 0,12mm thick, oncrete slab C16/20, 0.05m thick, crushed material densely packed with 0.30m thickness, regularization and compacting of the existing ground, supply, transport, laying and all the necessary complementary work, all executed according to the design.	m2	56.9	52.00 €	2,957.24 €	
3.1.5	**WATERPROOFING**					
3.1.4.1	Waterproofing type system Impermeability of the elements buried in contact with the ground, with application of bituminous paint in two coats, including supply, transport and placement, folds, overlaps, finishes and losses, all executed according to the project	m2	64.2	52.00 €	3,340.48 €	
	Important Notes: 1) The measures to determine quantities relating earth-works, were obtained from the geometric shapes defined in the design. No blistering, overcrowing, slopes or work platforms were considered. These costs should be included in the unit price of the excavation presented by the contractor. 2) Prior the start of the excavation, the contractor must certify whether or not plant network, such as water, sanition, gas, electrical and telephone installations and provision of their protection or diversion, must be reflected in the unit price of the excavation presented by the contractor. 3) The measures to determinate the quantities of reinfoced concrete were obtained from geometric shapes defined in the design. 4) The measurements of steel does not consider anchorages, overlays, hooks, scrap and accessories. These costs must be included in the unit price per kg submitted by the contractor. 5) In order to obtain all the charecteristics of the materials, including concrete and steel, should be consulted the drawing of Table Frame of Materials and General Notes.					

Original

REHABILITATION OF THE SAUDI MATERNITY HOSPITAL

KASSALA HEALTH CITADEL - SUDAN

BOQ - BILL OF QUANTITY
Package 6 (Block D)

CODE	DISCIPLINE	VALUE
4	WATER SUPPLY SYSTEM	4,986.15 €
5	WASTEWATER DRAINAGE SYSTEM	12,853.00 €
6	STORMWATER DRAINAGE SYSTEM	6,230.00 €
7	FIREFIGHTING WATER SYSTEM	6,665.10 €
TOTAL		**30,734.25 €**

AGENZIA ITALIANA PER LA COOPERAZIONE ALLO SVILUPPO

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
4.	**WATER SUPPLY SYSTEM**					
4.1	**Package 6 (Block D)**					**4,986.15 €**
4.1.1	**Pipping**					
4.1.1.1	Supply and installation of PP-R Pipes for the water supply netwotk, with thermal insulation in hot water, including all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.1.1.1	Cold Water:					
4.1.1.1.1.1	Ø 16 mm	m	13.20	3.00 €	39.60 €	
4.1.1.1.1.2	Ø 20 mm	m	65.00	3.00 €	195.00 €	
4.1.1.1.1.3	Ø 25 mm	m	48.00	3.50 €	168.00 €	
4.1.1.1.1.4	Ø 32 mm	m	16.00	3.50 €	56.00 €	
4.1.1.1.2	Hot Water:					
4.1.1.1.2.1	Ø 16 mm	m	26.50	3.00 €	79.50 €	
4.1.1.1.2.2	Ø 20 mm	m	23.00	3.50 €	80.50 €	
4.1.1.1.2.3	Ø 25 mm	m	6.00	4.00 €	24.00 €	
4.1.1.1.2.4	Ø 32 mm	m	18.95	4.00 €	75.80 €	
4.1.1.2	Supply and installation of HDPE pipeor the water supply network, buried, including earthworks and installation, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.1.2.1	Cold Water:					
4.1.1.2.1.1	Ø 40 mm	m	26.50	3.50 €	92.75 €	
4.1.2	**Equipment and Accessories**					
4.1.2.1	Supply and installation of angles Valves, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following equipments:					
	Wash Basin					
	- In cold water:	un	6	6.00 €	36.00 €	
	WC Cistern					
	- In cold water:	un	2	6.00 €	12.00 €	
4.1.2.2	Supply and installation of Valves, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.2.2.1	Ø 20 mm	un	1	7.00 €	7.00 €	
4.1.2.2.2	Ø 32 mm	un	8	10.00 €	80.00 €	
4.1.2.3	Supply and installation of shut-off buried Valves, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
4.1.2.3.1	Ø 40 mm	un	2	120.00 €	240.00 €	
4.1.2.4	Supply and installation of eletrical heaters with acumulation tank, includind shut-off valves, retention valves, electrical connection work, and all accessories, and all works and materials and accessories necessary to a correct execution of the task, with the following capacities:					
4.1.2.4.1	300L vertical	un	2	400.00 €	800.00 €	
4.1.3	**Complementary Work**					
4.1.3.1	Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	1,000.00 €	1,000.00 €	
4.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	500.00 €	500.00 €	
4.1.4	**Final Work**					
4.1.4.1	Verification, cleaning and testing of all network.	gv	1	1,000.00 €	1,000.00 €	
4.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	500.00 €	500.00 €	

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
5.	**WASTEWATER DRAINAGE SYSTEM**					
5.1	**Package 6 (Block D)**					**12,853.00 €**
5.1.1	**Pipping**					
5.1.1.1	Supply and installation of PVC pipes for buried/embedded wastewater drainage network (inside building), installed in proper ditches, as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans and construction supervision instructions, with the following diameters:					
5.1.1.1.1	Ø 40 mm	m	45.00	4.00 €	180.00 €	
5.1.1.1.2	Ø 75 mm	m	33.00	6.00 €	198.00 €	
5.1.1.1.3	Ø 90 mm	m	33.00	10.00 €	330.00 €	
5.1.1.2	Supply and installation of PVC pipes for buried/embedded wastewater drainage network (outside building), installed in proper ditches, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans and construction supervision instructions, with the following diameters:					
5.1.1.2.1	Ø 110 mm	m	43.00	10.00 €	430.00 €	
5.1.1.2.2	Ø 125 mm	m	15.00	15.00 €	225.00 €	
5.1.2	**Equipment and Accessories**					
5.1.2.1	Supply and installation of siphon, as well as all the works, materials and accessories necessary to the correct execution of the task, to install on the following equipments:					
5.1.2.1.1	Wash Basin	un	6	250.00 €	1,500.00 €	
5.1.2.1.2	Turkish Toilet	un	8	350.00 €	2,800.00 €	
5.1.2.1.3	Shower	un	8	250.00 €	2,000.00 €	
5.1.2.2	Supply and installation of traps in chrome plated brass, as well as all the works, materials and accessories necessary to the correct execution of the task.	un	4	20.00 €	80.00 €	
5.1.2.3	Supply and installation of ventilation hats, to be installed on the roof, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
5.1.2.3.1	Ø 90 mm	un	1	20.00 €	20.00 €	
5.1.2.4	Supply and installation of PVC floor gully with stainless steel grill, as well as all the works, materials and accessories necessary to the correct execution of the task.	un	2	20.00 €	40.00 €	
5.1.2.5	Execution of a concrete manholes supported by a suitable recessed cast iron covers, load class B125 to receive the same finishing of the floor, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans, detail drawings and construction supervision instructions, with the following dimensions:					
5.1.2.5.1	0.60x0.60	un	5	250.00 €	1,250.00 €	
5.1.2.5.2	0.80x0.80	un	2	300.00 €	600.00 €	
5.1.3	**Complementary Work**					
5.1.3.1	Construction work to support the implementation of wastewater networks, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	800.00 €	800.00 €	
5.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	500.00 €	500.00 €	
5.1.3.3	Evaluation, rehabilitation (if necessary), cleaning and maintenance works of existing networks to be maintained, including all materials and work necessary for their perfect execution.	gv	1	800.00 €	800.00 €	
5.1.4	**Final Work**					
5.1.4.1	Verification and testing of all network.	gv	1	300.00 €	300.00 €	
5.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	800.00 €	800.00 €	

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
6.	**STORMWATER DRAINAGE SYSTEM**					
6.1	**Package 6 (Block D)**					6,230.00 €
6.1.1	**Pipping**					
6.1.1.1	Supply and installation of PVC pipes for vertical rainwater drainage network, embedded/at sight, as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans and construction supervision instructions, with the following diameters:					
6.1.1.1.1	Ø 160 mm	m	8.00	15.00 €	120.00 €	
6.1.1.2	Supply and installation of PVC pipes for buried/embedded rainwater drainage network, installed in proper ditches, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans and construction supervision					
6.1.1.2.1	Ø 160 mm	m	32.00	15.00 €	480.00 €	
6.1.1.2.2	Ø 200 mm	m	19.00	20.00 €	380.00 €	
6.1.2	**Equipment and Accessories**					
6.1.2.1	Execution of a concrete manholes supported by a suitable gully cast iron covers, load class B125 to receive the same finishing of the floor, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans, detail drawings and construction supervision instructions, with the following					
6.1.2.1.1	0.40x0.40	un	2	250.00 €	500.00 €	
6.1.2.2	Execution of a concrete manholes supported by a suitable recessed cast iron covers, load class B125 to receive the same finishing of the floor, including terrain movements, such as excavation, landfill and transportation of remaining terrain offsite (if necessary), as well as all complementary works, materials and accessories necessary to the perfect execution of the task, according to the plans, detail drawings and construction supervision instructions, with the following dimensions:					
6.1.2.2.1	0.60x0.60	un	3	300.00 €	900.00 €	
6.1.2.2.2	0.60x0.80	un	1	350.00 €	350.00 €	
6.1.3	**Complementary Work**					
6.1.3.1	Construction work to support the implementation of wastewater networks, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	500.00 €	500.00 €	
6.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	1,000.00 €	1,000.00 €	
6.1.3.3	Evaluation, rehabilitation (if necessary), cleaning and maintenance works of existing networks to be maintained, including all materials and work necessary for their perfect execution.	gv	1	1,000.00 €	1,000.00 €	
6.1.4	**Final Work**					
6.1.4.1	Verification and testing of all network.	gv	1	500.00 €	500.00 €	
6.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	500.00 €	500.00 €	

AGENZIA ITALIANA PER LA COOPERAZIONE ALLO SVILUPPO

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
7.	**FIREFIGHTING WATER SYSTEM**					
7.1	**Package 6 (Block D)**					**6,665.10 €**
7.1.1	**Pipping**					
7.1.1.1	Supply and installation of HDPE pipe, for Firefighting network, buried, including earthworks and installation, as well as all the works, materials and accessories necessary to the correct execution of the task, with the following diameters:					
7.1.1.1.1	Ø 75 mm	m	16.00	33.60 €	537.60 €	
7.1.1.2	Supply and Installation of Galvanized steel pipe, for the Firefighting network, including bonding and branch accessories, supports and clamps with acoustic insulation, threaded or grooved, installed at sight, fixed by quick-mount clamps in galvanized iron attached to walls or ceilings, including opening and closure of notches, wall/floor/ceilings holes for pipe crossings, a first coat of painting anticorrosive, and two coats of colour finishing according legal standards, and remaining accessories necessary to the good functioning of the network, according the plans and construction supervision instruction, with the following diameters:					
7.1.1.2.1	Ø 50 mm	m	27.50	25.00 €	687.50 €	
7.1.2	**Equipment and Accessories**					
7.1.2.1	Supply and installation of Swing type fire hosereel, Model 99-N(19mm), to be installed in a closet with 180º opening door, predicted by the architecture, with reinforced PVC hose, with 30m length, 3 position nozzle: jet, fog and closure, including manual quick-release valve with manometer, axial bracket, tested and approved according EN 671-1:2012, remaining accessories and necessary works for a perfect execution of the task according construction supervision instructions.	un	2	720.00 €	1,440.00 €	
7.1.3	**Complementary Work**					
7.1.3.1	Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	gv	1	1,800.00 €	1,800.00 €	
7.1.3.2	Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	gv	1	1,200.00 €	1,200.00 €	
7.1.4	**Final Work**					
7.1.4.1	Verification, cleaning and testing of all network.	gv	1	500.00 €	500.00 €	
7.1.4.2	Elaboration of the pieces drawn according to the work executed.	gv	1	500.00 €	500.00 €	

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
	8 ELECTRICAL INSTALLATIONS					
8.1	**BLOCK D**					28,853.00 €
	The Bill of Quantities, Specifications, Drawings and all other Contract documents are complementary to each other. **It is the responsibility of the Contractor to check the locations and quantities of the materials and equipment to be executed in accordance with the drawings.** **The unit rate of the materials and equipment shall be based on the Specification, all components as required and specified under each item concerned in the Specifications, Drawings, and all other Contract documents.**					
8.1.1	**Low Voltage Switchboard**					
8.1.1.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.1.2	Normal / Standby Switchboards:					
8.1.1.2.1	- S.D.0 (E)	Un	1	300.00 €	300.00 €	
8.1.1.2.2	- S.D.1 (E)	Un	1	250.00 €	250.00 €	
8.1.2	**Cabling**					
8.1.2.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.2.2	Distribution Cables (Outdoor):					
8.1.2.2.1	- 5G10 mm² Al/ XLPE/ PVC	ml	16	15.00 €	240.00 €	
8.1.2.2	Distribution Cables (Indoor):					
8.1.2.2.1	- 5G10 mm² Al/ XLPE/ PVC	ml	102	15.00 €	1,530.00 €	
8.1.2.2.2	- 5G6 mm² Al/ XLPE/ PVC	ml	103	15.00 €	1,545.00 €	
8.1.3	**Lighting**					
8.1.3.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.3.2	Indoor Lighting:					
8.1.3.2.1	Luminaires:					
8.1.3.2.1.1	- L1	Un	2	20.00 €	40.00 €	
8.1.3.2.1.2	- L3 1	Un	23	20.00 €	460.00 €	
8.1.3.2.1.3	- L3.2	Un	4	22.00 €	88.00 €	
8.1.3.2.1.4	- L4.1	Un	4	40.00 €	160.00 €	
8.1.3.2.1.5	- L9.1	Un	1	50.00 €	50.00 €	
8.1.3.2.1.6	- L9.2	Un	2	50.00 €	100.00 €	
8.1.3.2.1.7	- L11	Un	5	40.00 €	200.00 €	
8.1.3.2.1.8	- L12	Un	4	40.00 €	160.00 €	
8.1.3.2.1.9	- L15.1	Un	14	20.00 €	280.00 €	
8.1.3.2.1.10	- L15.2	Un	2	20.00 €	40.00 €	
8.1.3.2.1.11	- L17	Un	28	30.00 €	840.00 €	
8.1.3.3	Lighting Command Devices					
8.1.3.3.1	- One way switch, surface mounting	Un	3	15.00 €	45.00 €	
8.1.3.3.2	- Double pole switch, surface mounting	Un	16	15.00 €	240.00 €	
8.1.3.3.3	- Two way switch, surface mounting	Un	2	15.00 €	30.00 €	
8.1.3.3.4	- Surface Mounting Movement Detector 180°	Un	18	20.00 €	360.00 €	
8.1.3.3.5	- Surface Mounting Movement Detector 360°	Un	12	30.00 €	360.00 €	
8.1.3.4	Flush and surface Mounting Boxes:					
8.1.3.4.1	- Surface or Recessed mounting Connection Box	Un	93	2.00 €	186.00 €	
8.1.3.5	Electrical cables:					
8.1.3.5.1	Enclosed in a recessed or surface conduiting:					
8.1.3.5.1.1	- 2x 1,5 mm² Cu/ XLPE/ LSZH	ml	30	1.50 €	45.00 €	
8.1.3.5.1.2	- 3x 1,5 mm² Cu/ XLPE/ LSZH	ml	123	2.00 €	246.00 €	
8.1.3.5.1.3	- 3G 1,5 mm² Cu/ XLPE/ LSZH	ml	288	2.00 €	576.00 €	
8.1.3.5.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
8.1.3.5.2.1	- 3x 1,5 mm² Cu/ XLPE/ LSZH	ml	84	2.00 €	168.00 €	
8.1.3.5.2.2	- 3G 1,5 mm² Cu/ XLPE/ LSZH	ml	389	2.00 €	778.00 €	
8.1.3.6	Metric Rigid Conduit:					
8.1.3.6.1	Enclosed in a recessed or surface conduiting:					
8.1.3.6.1.1	- PEAD Ø 20 mm	ml	441	0.50 €	220.50 €	
8.1.4	**Emergency / Safety Lighting**					
8.1.4.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.4.2	Indoor Lighting:					
8.1.4.2.1	- S1 - not maintained (60min Autonomy)	Un	22	50.00 €	1,100.00 €	
8.1.4.2.2	- S2 - maintained (60min Autonomy)	Un	6	40.00 €	240.00 €	
8.1.4.3	Electrical cables:					
8.1.4.3.1	Enclosed in a recessed or surface conduiting:					
8.1.4.3.1.1	- 3G 1,5 mm² Cu/ XLPE/ LSZH	ml	138	2.00 €	276.00 €	
8.1.4.4	Metric Rigid Conduit:					
8.1.4.4.1	Enclosed in a recessed or surface conduiting:					
8.1.4.4.1.1	- PVC Ø 20 mm	ml	138	0.50 €	69.00 €	
8.1.5	**General Purpose Power Outlet**					
8.1.5.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.5.2	Single Flush and Surface Mounting Devices - Normal/Standby Supply:					
8.1.5.2.1	- Surface mounting earth Socket (BS Type) - 16A IP44	Un	14	15.00 €	210.00 €	
8.1.5.2.2	- Surface mounting earth Socket (BS Type) - 16A with cover IP44	Un	4	15.00 €	60.00 €	
8.1.5.2.3	- Flush Mounting Earthed Socket (BS Type) - 16A trunking	Un	4	15.00 €	60.00 €	
8.1.5.3	Double Flush and Surface Mounting Devices - Normal/Standby Supply:					
8.1.5.3.1	- Flush Mounting Earthed Socket (BS Type) - 16A trunking	Un	91	17.00 €	1,547.00 €	
8.1.5.8	Flush and surface Mounting Boxes:					
8.1.5.8.1	- Surface or Recessed mounting Connection Box	Un	46	2.00 €	92.00 €	
8.1.5.8.2	- Surface or Recessed mounting Terminal Box	Un	43	2.00 €	86.00 €	
8.1.5.9	Electrical cables:					
8.1.5.9.1	Enclosed in a recessed or surface conduiting:					
8.1.5.9.1.1	- 3G 2.5 mm² Cu/ XLPE/ LSZH	ml	845	2.00 €	1,690.00 €	
8.1.5.9.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
8.1.5.9.2.1	- 3G 2.5 mm² Cu/ XLPE/ LSZH	ml	1449	2.00 €	2,898.00 €	
8.1.5.10	Metric Rigid Conduit:					
8.1.5.10.1	Enclosed in a recessed or surface conduiting:					
8.1.5.10.1.1	- PVC Ø 20 mm	ml	845	0.50 €	422.50 €	

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES [Euros]		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
	8 ELECTRICAL INSTALLATIONS					
8.1.6	**Cable tray, Trunking System and Conduits**					
8.1.6.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
8.1.6.2	Metalic perforated cable tray of side height 60 mm:					
8.1.6.2.1	Electrical Instalation:					
8.1.6.2.1.1	- 200 width, strip-galvanised	ml	180	20.00 €	3,600.00 €	
8.1.6.2.2	ICT Instalation:					
8.1.6.2.2.1	- 100 width, strip-galvanised	ml	55	15.00 €	825.00 €	
8.1.6.2.2.2	- 200 width, strip-galvanised	ml	70	20.00 €	1,400.00 €	
8.1.6.3	Distribution Cable-Trunkings:					
8.1.6.3.1	- Cable-Trunkings, with 110x50mm	ml	180	15.00 €	2,700.00 €	
8.1.6.4	Metric Rigid Conduit:					
8.1.6.4.1	Enclosed in a recessed or surface conduiting:					
8.1.6.4.1.1	- PVC Ø 25 mm	ml	80	0.50 €	40.00 €	
8.1.7	**Complementary Work**					
8.1.7.1	- Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	Gv	1	1,000.00 €	1,000.00 €	
8.1.7.2	- Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	Gv	1	1,000.00 €	1,000.00 €	
8.1.8	**Final Work**					
8.1.8.1	- Verification, cleaning and testing of all network.	Gv	1	500.00 €	500.00 €	
8.1.8.2	- Elaboration of the pieces drawn according to the work executed.	Gv	1	500.00 €	500.00 €	
	TOTAL ELECTRICAL INSTALLATIONS					29,853.00 €

AGENZIA ITALIANA PER LA COOPERAZIONE ALLO SVILUPPO

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros) Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
9.	**INFORMATION & COMMUNICATIONS TECHNOLOGY (ITC)**					
9.1	**BLOCK D**					**61,943.88 €**
	The Bill of Quantities, Specifications, Drawings and all other Contract documents are complementary to each other. **It is the responsibility of the Contractor to check the locations and quantities of the materials and equipment to be executed in accordance with the drawings.** **The unit rate of the materials and equipment shall be based on the Specification, all components as required and specified under each item concerned in the Specifications, Drawings, and all other Contract documents.**					
9.1.1	**TCP/IP Network**					
9.1.1.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
9.1.1.1.1	Building Telecommunications Racks, Boxes and Cabinets:					
9.1.1.1.1.1	**- (Rack 1)**					
9.1.1.1.1.1.1	- Server Cabinet 12U´s (Rack 19" A800xL600xP600 [mm]	Un	1	816.00 €	816.00 €	
9.1.1.1.1.1.2	- Optical Fiber Panel 12 SC/APC connector (OF arrival)	Un	1	540.00 €	540.00 €	
9.1.1.1.1.1.3	- Painel Coaxial (RG-CC Mirror)	Un	1	150.00 €	150.00 €	
9.1.1.1.1.1.4	- Patch Panel 1HU 24 RJ45 Cat 6A connector. (Distribution)	Un	1	306.00 €	306.00 €	
9.1.1.1.1.1.5	- Outlet Rackmount Power Strip 220V with a breaker.	Un	1	105.60 €	105.60 €	
9.1.1.1.1.1.6	- Including, set of 2 fans with thermostat, Fixed Shelf, Cable Management, Rings, and all required accessories and equipments necessary for its perfect assembly and operation.	Un	1	162.00 €	162.00 €	
9.1.1.1.2	Flush and Surface Mounting Devices:					
9.1.1.1.2.1	- Data outlet 2xRJ45 CAT 6A - Surfaced assembly	Un	2	42.00 €	84.00 €	
9.1.1.1.2.2	- Data outlet 2xRJ45 CAT 6A - Trunkung System assembly	Un	3	49.56 €	148.68 €	
9.1.1.1.3	Electrical cables:					
9.1.1.1.3.1	Enclosed in a recessed or surface conduiting:					
9.1.1.1.3.1.1	- U/UTP Category 6A Copper LSZH	ml	40	1.32 €	52.80 €	
9.1.1.1.3.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
9.1.1.1.3.2.1	- U/UTP Cat 6 LSZH	ml	200	1.92 €	384.00 €	
9.1.1.1.4	Patch cords:					
9.1.1.1.4.1	- U/UTP Category 6A Copper 1,0mt LSZH	Un	24	6.00 €	144.00 €	
9.1.1.1.4.2	- U/UTP Category 6A Copper 3mt LSZH	Un	24	9.60 €	230.40 €	
9.1.1.1.4.3	- FO 50/125 OM3 LSZH	Un	2	55.20 €	110.40 €	
9.1.1.1.5	Metric Rigid Conduit:					
9.1.1.1.5.1	Enclosed in a recessed or surface conduiting:					
9.1.1.1.5.1.1	- PVC Ø 25 mm	ml	35	0.96 €	33.60 €	
9.1.1.1.6	Others:					
9.1.1.1.6.1	- Engineering, System Programming, including System Testing, Commissioning and Training.	Gv	1	720.00 €	720.00 €	
9.1.1.1.6.2	- Connections, connectorizations and labeling.	Gv	1	336.00 €	336.00 €	
9.1.2	**Nurse Call System**					
9.1.2.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
9.1.2.1.1	Nurse Call System Devices:					
9.1.2.1.1.1	- System server Module with license; With Ethernet interface; with Web server; Web Configuration interface; With Autofeed; Supplied with UTP CAT 6A LSZH yellow 1.5 metres; DHCP required for System setup. Including the test tool, to instaled in the premises for servers.	Gv	1	5,184.00 €	5,184.00 €	
9.1.2.1.1.2	- Module de serveur de voix sur IP (VoIP); avec interface ethernet; avec l'interface avec le central téléphonique; avec une capacité de 120 lits; avec module graphique et organisateur de appels avec serveur web; interface de configuration web; avec autoalimenté; fourni avec fouet UTP CAT 6A LSZH jaune 1,5 mètres, à installé dans le Locaux pour les serveurs	Gv	1	1,848.00 €	1,848.00 €	
9.1.2.1.1.3	- Main Door visual controller and indicator (P)	Un	12	294.00 €	3,528.00 €	
9.1.2.1.1.4	- Secundary Door visual controller and indicator (S)	Un	7	2.40 €	16.80 €	
9.1.2.1.1.5	- Call module 2 buttons	Un	180	114.00 €	20,520.00 €	
9.1.2.1.1.6	- Nurse display panel with audio	Un	2	1,140.00 €	2,280.00 €	
9.1.2.1.1.7	- WC Call module no buttons	Un	2	456.00 €	912.00 €	
9.1.2.1.2	Electrical cables:					
9.1.2.1.2.1	Enclosed in a recessed or surface conduiting:					
9.1.2.1.2.1.1	- U/UTP 4 pair, CAT6A, LSZH, 250/23	ml	10	1.32 €	13.20 €	
9.1.2.1.2.1.2	- Bus Cable	ml	250	2.40 €	600.00 €	
9.1.2.1.2.2	On the air, fixed on a cable tray or ladder horizontal or vertical:					
9.1.2.1.2.2.1	- U/UTP 4 pair, CAT6A, LSZH, 250/23	ml	200	1.92 €	384.00 €	
9.1.2.1.2.2.2	- Bus Cable	ml	100	2.40 €	240.00 €	
9.1.2.1.3	Metric Rigid Conduit:					
9.1.2.1.3.1	Enclosed in a recessed or surface conduiting:					

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
9.	**INFORMATION & COMMUNICATIONS TECHNOLOGY (ITC)**					
9.1.2.1.3.1.1	- PVC Ø 20 mm	ml	250	0.78 €	195.00 €	
9.1.2.1.4	Others:					
9.1.2.1.4.1	- Engineering, System Programming, including System Testing, Commissioning and Training.	Gv	1	11,760.00 €	11,760.00 €	
9.1.3	**Fire Detection System**					
9.1.3.1	Supply and installation in accordance with the conditions defined in the in written pieces, specification, drawings and other elements of the project, for the following equipment and materials, and all required accessories as specified in schedules of equipment, detailed drawings and specs:					
9.1.3.1.1	Fire Detection Devices:					
9.1.3.1.1.1	- Repeater alarm panel sounder/beacons Orange	Un	1	576.00 €	576.00 €	
9.1.3.1.1.2	- Manual call points	Un	4	210.00 €	840.00 €	
9.1.3.1.1.3	- Optical smoke detector including detector base	Un	21	54.00 €	1,134.00 €	
9.1.3.1.1.4	- Siren including base	Un	1	222.00 €	222.00 €	
9.1.3.1.2	Electrical cables:					
9.1.3.1.2.1	Enclosed in a recessed or surface conduiting:					
9.1.3.1.2.1.1	- JE-H(st)H 2x2x0.8mm²	ml	160	2.64 €	422.40 €	
9.1.3.1.2.2	On the air, fixed on a cable trav or ladder horizontal or vertical:					
9.1.3.1.2.2.1	- JE-H(st)H 2x2x0.8mm²	ml	200	3.84 €	768.00 €	
9.1.3.1.3	Metric Rigid Conduit:					
9.1.3.1.3.1	Enclosed in a recessed or surface conduiting:					
9.1.3.1.3.1.1	- PVC Ø 20 mm	ml	150	0.78 €	117.00 €	
9.1.3.1.4	Others:					
9.1.3.1.4.1	- Engineering, System Programming, including System Testing, Commissioning and Training.	Gv	1	1,200.00 €	1,200.00 €	
9.1.4	**Complementary Work**					
9.1.4.1	Construction work to support the implementation of water distribution networks for fire-fighting purposes, as well as all the works, materials and accessories necessary to the correct execution of the task.	Gv	1	1,200.00 €	1,200.00 €	
9.1.4.1.1	- Supply and installation of intumescent clamps and sleeves with characteristics EI60 and EI90 for fire protection at crossings of pipes in combustible material, as well as all the works, materials and accessories necessary to the correct execution of the task	Gv	1	1,200.00 €	1,200.00 €	
9.1.5	**Final Work**					
9.1.5.1	- Verification, cleaning and testing of all network.	Gv	1	1,440.00 €	1,440.00 €	
9.1.5.2	- Elaboration of the pieces drawn according to the work executed.	Gv	1	1,020.00 €	1,020.00 €	
TOTAL ITC						61,943.88 €

Original

CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
10	**Ventilation and Air Conditioning (VAC)**					
	BLOCK D					34,532.00 €
10.1	**Ventilation and Air Conditioning (VAC)**					
10.1.1	**Ducts and Casings (Section 3/4/6)**					
10.1.1.1	Supply and installation of spiral galvanized steel ductwork and fittings including hangers and washers covered in an approved vapour seal, complete with duct cladding, volume control dampers, fire dampers, supports and all required accessories as per technical specifications and drawings.					
10.1.1.1.1	Spiral galvanized steel ductwork without insulation					
10.1.1.1.1.1	- DN 125	ml	1.20	50.00 €	60.00 €	
10.1.1.1.1.2	- DN 150	ml	0.20	60.00 €	12.00 €	
10.1.2	**VAC Fans (Section 8)**					
10.1.2.1	Supply and installation of exhaust and ceiling fans complete with fittings, flexible connectors, spring mount vibration isolators, frequency inverter, protection against corrosion and all required accessories as specified in schedules of equipment, detailed drawings and technical specifications.					
10.1.2.1.1	Exhaust wall mounted Fan					
10.1.2.1.1.1	- EF1 - S&P Silent 200	Un	10.00	100.00 €	1,000.00 €	
10.1.2.1.1.2	- EF2 - S&P Silent 300	Un	1.00	120.00 €	120.00 €	
10.1.2.1.2	Ceiling fans					
10.1.2.1.2.1	- CF2 - Ceiling fan - S&P HTB 90 RC	Un	3.00	120.00 €	360.00 €	
10.1.2.1.2.2	- CF3 - Ceiling fan - S&P HTB 150 RC	Un	14.00	150.00 €	2,100.00 €	
10.1.3	**Air Outlets And Inlets (Section 10)**					
10.1.3.1	Supply and installation of exhaust air louvers complete with insect screen and gravity shutters including connections to ductwork and all required accessories as per technical specifications and drawings.					
10.1.3.1.1	- EL1 - 200x200	Un	11.00	90.00 €	990.00 €	
10.1.4	**Split Air Conditioners (Section 11)**					
10.1.4.1	Supply and installation of outdoor units, including integral controls, protection device, protection against corrosion, complete with condensate piping, as per technical specifications and drawings.					
10.1.4.1.1	CDU2 - LGS12EQ.UA3	Un	3.00	700.00 €	2,100.00 €	
10.1.4.1.2	CDU3 - LGS18EQ.UL2	Un	14.00	800.00 €	11,200.00 €	
10.1.4.2	Supply and installation of indoor units, including wired remote control, accessories, supports as per technical specifications and drawings.					
10.1.4.2.1	FCU2 - LGS12EQ.NSJ	Un	3.00	300.00 €	900.00 €	
10.1.4.2.2	FCU3 - LGS18EQ.NSK	Un	14.00	400.00 €	5,600.00 €	
10.1.5	**HVAC Testing, Adjusting and Balancing (Section 13)**					
10.1.5.1	Final tests of the installation including balancing, adjusting, commissioning and handling to client complete operational systems and equipment as per technical specifications and drawings. installation according to drawings and specifications.	Gv	1.00	1,000.00 €	1,000.00 €	
10.2	**Hydraulic installations VAC**					
10.2.1	**Refrigerant Piping (Section 14)**					
10.2.1.1	Supply and installation of refrigeration tube - EN 12735-1, copper tube designed specifically for refrigeration and air conditioning use and accordingly cleaned, nitrogen-purged and capped, complete with all necessary fittings, supports and all required accessories as technical specifications and drawings.					
10.2.1.1.1	Copper with thermal insulation and protection exposed pipe by aluminium cladding					
10.2.1.1.1.1	- Liq Ø6.4 mm / Gas Ø9.5 mm	ml	13.00	50.00 €	650.00 €	
10.2.1.1.1.2	- Liq Ø6.4 mm / Gas Ø12.7 mm	ml	69.00	60.00 €	4,140.00 €	
10.2.1.1.2	Supply and installation of drainage pipe work complete with all necessary fittings, supports and accessories within building as per technical specifications and drawings.	Gv	1.00	300.00 €	300.00 €	
10.3	**General**					
10.3.1	Identification for VAC Ducting Piping and Equipment.	Gv	1.00	500.00 €	500.00 €	
10.3.2	Painting, Tagging and Labelling of entire mechanical system as specified.	Gv	1.00	500.00 €	500.00 €	
10.3.3	Maintenance for two years (guarantee period), including supply of all needed spare parts during the year.	Gv	1.00	2,000.00 €	2,000.00 €	
10.3.4	Transport of Equipment VAC	Gv	1.00	1,000.00 €	1,000.00 €	

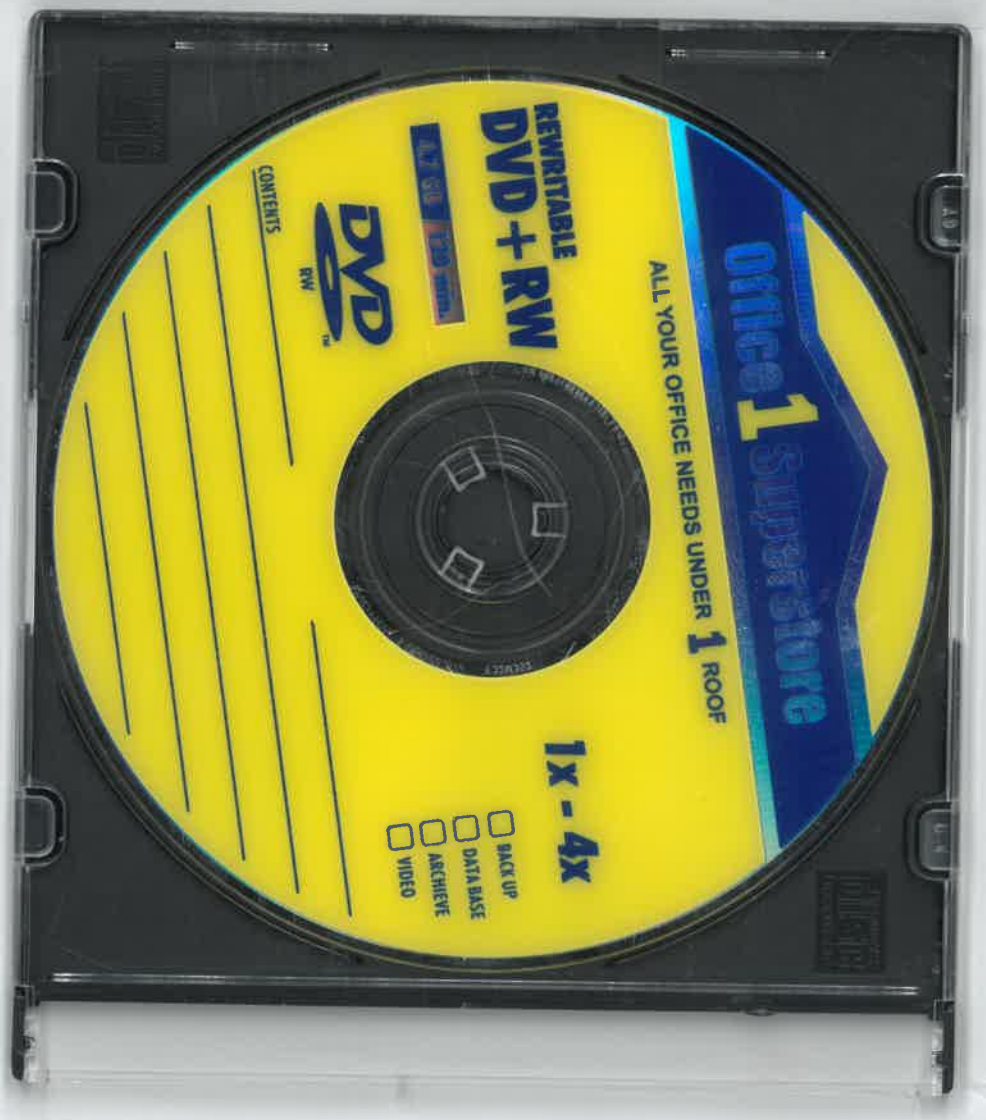
CODE	DESCRIPTION	UNITS	QUANTITIES	PRICES (Euros)		
				Unitary	Partial	Totals
	BOQ - BILL OF QUANTITY					
13	**FIRE SAFETY**					
13.1	**BLOCK D**					**2,640.00 €**
13.1.1	**EMERGENCY SIGNS**					
13.1.1.1	Application of emergency signs, in accordance with the fire safety project, with the following dimensions:					
13.1.1.1.1	**200 x 200 mm:**					
13.1.1.1.1.1	S1 - Fire extinguisher	un	7.0	60.00 €	420.00 €	
13.1.1.1.2	**150 x 200 mm:**					
13.1.1.1.2.1	S2 - Fire Alarm	un	4.0	45.00 €	180.00 €	
13.1.1.1.2.2	S4 - Fire Hose	un	2.0	45.00 €	90.00 €	
13.1.1.1.2.3	S5 - Fire extinguisher Instructions for use, Carbon Dioxide	un	1.0	45.00 €	45.00 €	
13.1.1.1.2.4	S6 - Fire extinguisher Instructions for use, ABC Powder	un	6.0	45.00 €	270.00 €	
13.1.1.1.3	**300 x 300 mm:**					
13.1.1.1.3.1	P1 - Warning, Elecric switch	un	2.0	75.00 €	150.00 €	
13.1.1.1.4	PE - Application of Escape Plan and simplified instructions, in accordance with the fire safety project.	un	1.0	75.00 €	75.00 €	
13.1.2	**MEANS OF FIRST INTERVENTION**					
13.1.2.1	**EXTINGUISHERS**					
13.1.2.1.1	Installation of portable fire extinguishers with the following characteristics:					
13.1.2.1.1.1	ABC Powder, 6kg	un	6.0	210.00 €	1,260.00 €	
13.1.2.1.1.2	Carbon Dioxide (CO_2), 2kg	un	1.0	150.00 €	150.00 €	

TECHNICAL DOCUMENTATION AND DRAWINGS

OUR REF.: SDN 13 - CUP J89D16003130006 - CIG: Z452C78D56

Rehabilitation of Saudi Maternity Hospital - K_05 - Kassala city,

State of Kassala, Sudan



Original

PLEASE COMPLETE AND SIGN THIS FORM AND ATTACH COPIES OF OFFICIAL SUPPORTING DOCUMENTS (REGISTER(S) OF COMPANIES, OFFICIAL GAZETTE, VAT REGISTRATION, ETC.)

LEGAL ENTITY

PRIVACY STATEMENT http://ec.europa.eu/budget/contracts_grants/info_contracts/legal_entities/legal_entities_en.cfm#en

Please use CAPITAL LETTERS and LATIN CHARACTERS when filling in the form.

PRIVATE/PUBLIC LAW BODY WITH LEGAL FORM

OFFICIAL NAME ①	TIHRAGA Engineering for Building Company
BUSINESS NAME (if different)	TIHRAGA Engineering for Building Company
ABBREVIATION	TIHRAGA Engineering for Building Co
LEGAL FORM	
ORGANISATION TYPE	FOR PROFIT [X] NON FOR PROFIT [ ] NGO ② YES [ ] NO [ ]
MAIN REGISTRATION NUMBER ③	C/15964
SECONDARY REGISTRATION NUMBER (if applicable)	N/A
PLACE OF MAIN REGISTRATION	CITY Khartoum; COUNTRY SUDAN
DATE OF MAIN REGISTRATION	18 (DD) 12 (MM) 2000 (YYYY)
VAT NUMBER	449
ADDRESS OF HEAD OFFICE	Ground Floor-Building No 3/1-Sq4 Middle Bahry-Ingaz Street West Railway Buildings- Khartoum North- Khartoum-Sudan
POSTCODE	11111
P.O. BOX	8276
CITY	Khartoum
COUNTRY	Sudan
PHONE	00249912306176-00249912394391
E-MAIL	khalidsanosi@yahoo.com ibrahimbakri1973@gmail.com

DATE 28/05/2020

STAMP

SIGNATURE OF AUTHORISED REPRESENTATIVE

① National denomination and its translation in EN or FR if existing.

② NGO = Non Governmental Organisation, to be completed if NFPO is indicated.

③ Registration number in the national register of companies. See table with corresponding field denomination by country.

AGENZIA ITALIANA PER LA COOPERAZIONE ALLO SVILUPPO

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Original

FINANCIAL IDENTIFICATION

PRIVACY STATEMENT http://ec.europa.eu/budget/contracts_grants/info_contracts/financial_id/financial_id_en.cfm#en

Please use CAPITAL LETTERS and LATIN CHARACTERS when filling in the form.

BANKING DETAILS ①

ACCOUNT NAME ② Tihraga Engineering for Building co LLC

IBAN/ACCOUNT NUMBER ③ 1057952712400 1

CURRENCY

BIC/SWIFT CODE ADCBAEAA BRANCH CODE ④

BANK NAME ABu Dhabi commercial Bank

ADDRESS OF BANK BRANCH

STREET & NUMBER Almaja Z Branch, 30 St, sharjah, united Arab Emirates.

TOWN/CITY Sharjah POSTCODE

COUNTRY united Arab Emirates

ACCOUNT HOLDER'S DATA

AS DECLARED TO THE BANK

ACCOUNT HOLDER TIHRAGA Engineering for Building Company.

STREET & NUMBER Ingaz street

TOWN/CITY Khartoum POSTCODE 11111

COUNTRY Sudan

REMARK

BANK STAMP + SIGNATURE OF BANK REPRESENTATIVE ⑤

DATE (Obligatory)

SIGNATURE OF ACCOUNT HOLDER (Obligatory)

① Enter the final bank data and not the data of the intermediary bank.

② This does not refer to the type of account. The account name is usually the one of the account holder. However, the account holder may have chosen to give a different name to its bank account.

③ Fill in the IBAN Code (International Bank Account Number) if it exists in the country where your bank is established

④ Only applicable for US (ABA code), for AU/NZ (BSB code) and for CA (Transit code). Does not apply for other countries.

⑤ It is preferable to attach a copy of RECENT bank statement. Please note that the bank statement has to confirm all the information listed above under 'ACCOUNT NAME', 'ACCOUNT NUMBER/IBAN' and 'BANK NAME'. With an attached statement, the stamp of the bank and the signature of the bank's representative are not required. The signature of the account-holder and the date are ALWAYS mandatory.

AGENZIA ITALIANA PER LA COOPERAZIONE ALLO SVILUPPO