بسم الله الرحمن الرحيم

THE HASHEMITE KINGDOM OF JORDAN

IRBID DISTRICT ELECTRICITY COMPANY LTD.

Replacement of Power Transformers for Irbid South and Irbid City Center Substations

TENDER No.8/2016

VOLUME 1 OF 2 VOLUMES

Instructions to Persons Tendering, Form of Tender,
Agreement and Bond and Schedules

TENDER FORM

THE GENERAL MANAGER
Irbid District Electricity Company Ltd.
P.O. Box 46 Irbid 21110
The Hashemite Kingdom of Jordan
E-mail:ideco@ideco.Com.jo
Website:www.ideco.Com.jo
Fax. + 96227245495

TENDER NO. 8/2016
FOR

Replacement of Power Transformers for Irbid South and Irbid City Center Substations

INDEX TO VOLUME 1 OF 2

Schedules

THE HASHEMITE KINGDOM OF JORDAN
IRBID DISTRICT ELECTRICITY COMPANY LTD
Replacement of Power Transformers for Irbid South and Irbid City Center Substations
TENDER NO. 8/2016

INSTRUCTIONS TO PERSONS TENDERING

1- TENDER DOCUMENTS

Each set of tender document consists of:-

- 3 copies of Volume 1 - Instructions to persons tendering, form of Tender, Agreement and Bond, and Schedules.
- 1 copy of Volume 2 - Conditions of contract and Technical Specification.

2- CONDITIONS OF CONTRACT

2.1 A complete supply and erection contract is required in accordance with the Condition of Contract (International) for Electrical and Mechanical works (including erection on site) as prepared by the International Federation of Consulting Engineers (FIDIC), First Edition May 1963, reprinted May 1983 with modifications.

2.2 If the Tenderer has any doubt as to the meaning of any portion of the General Conditions or of the Agreement or of the Specification of Drawings, he shall , when submitting his Tender, set out in his covering letter the interpretation on which he relies .

2.3 The employer reserve the right to order this tender partially among different tenderers regarding to project scope; i.e. split award for power transformer 33/11 Kv scope.

3- SPECIFICATION AND STANDARDS

3.1 Where compliance with an IEC or other standards is called for, the standard used (unless a standard date is given) shall be that in force at the time of tender.

3.2 References to brand names or catalogue numbers, if any, in the Specification have been made only for that equipment for which it has been determined that a degree of standardization is necessary to maintain certain essential features. In certain instances such references have also been made for purposes of convenience to specify the requirements. In either case offers of alternative goods which have similar characteristics and provide performance and quality at least equal to those specified will be considered on their merits.

3.3 The Tenderer shall detail in the relevant Tender Schedule in order of the relevant clauses, a statement of any departures from the Specification.

3.4 If the Tenderer offers materials or equipment which conform to Recommendations or Standards other than those specified, full details of the differences between the proposed Recommendations or Standards, in so far as they affect the design or performance of the equipment, shall be submitted with the Tender .

4-TENDERERS ELIGIBILITY AND QUALIFICATIONS

The documentary evidence of the Tenderer's qualifications to perform the contract shall establish to the Employer's satisfaction:

4.1 That, in the case of a Tenderer offering to supply Plant and Equipment under the Contract which the Tenderer does not manufacture or otherwise produce, the Tenderer has been duly authorized by the manufacturer or producer of the Plant and Equipment to supply them in the Employer's country for this specific tender.

4.2 In the event that the intended contract signatory does not manufacture one or more of the main sections of plants, then the Tender submitted should give satisfactory evidence to show that all the obligations imposed by the document on the intended signatory have been fully understood and accepted, where applicable, by the manufacturer(s) to whom it would be intended to sub-contract one or more of the main sections of the plant. See also the General Conditions of Contract.

4.3 The Tenderer’s shall provide financial statements for the last 10 years.

4.4 evidence for technical and production capability necessary to perform the IDECO Contract, in particular it is required that.

4.5 The Tenderer shall have completed facilities involving plant and equipment rated as specified, or greater, of equivalent complexity, and on a similar Turnkey basis, on at least three previous assignments in at least three different countries. Within the last 10 years. Documentary evidence from the end users must be provided.

4.6 The Tenderer shall provide documentation, certified by the owner, to show that the equipment to be supplied, having the specified rating of voltage and capacity and the same place of manufacture, is in successful commercial service for minimum of 10 years in three different countries within the last 10 years for transformer. For switchgear same statement applied for manufacturer experience except that new version of switchgear to be in service for minimum two years in three different countries.

4.7 Evidence is to be supplied with the tender to show the nature of the erecting organization and its relation to the intended signatory to the Contract.

4.8 Evidence is also to be supplied to show the competence of the erecting organization to undertake installation of the type of construction specified together with details of specialized staff which are to be provided.

4.9 Information shall be supplied as required by the Schedule of Tenderer's Experience contained in Schedule (W) of this Volume. Failure to supply all required qualification documentation (i.e. equipment end user certificates, Tenderer's experience documentation and civil works subcontractor experience documentation) to the satisfaction of the employer will result in rejection of the tender.

4.10 The main subcontractor shall have supplied equipment which has been in commercial operation as stated in (4.6) above. This requirement applies to equipment from same manufacturing unit which will supply the equipment for this project; experience of other manufacturing units within the subcontractor's organization is not acceptable.

4.11 Foreign Tenderers must submit their tender through a registered local agent· or through their registered office in Jordan. It is a Jordanian Government requirement that every Tendered must have a Local Agent who shall be a person or firm of Jordanian Nationality having a valid trade license and registered with the relevant Local Authorities.

Evidence is to be supplied with the Tender to show appointment of or partnership with such a Local Agent. Tenders not accompanied by such evidence will not be considered.

4.12 Provide certificates show that the manufacturer do all type tests required from IEC standards for circuit breakers and switchgear panels in reputable and laborites.

5- PREPARATION AND COMPOSITION OF TENDER

5.1 The Tender must be made in duplicate on the accompanying Forms of Tender with all blanks therein and in all the Schedules duly filled up in ink and signed. The Tender Price must include all incidental and contingent expenses. In particular the Form of Tender must be completed and signed without alteration.

Tenderers are particularly directed that the amount entered on the Form of Tender shall be for performing the Contract strictly in accordance with the bound document and shall be the sum total of all the amounts printed into and entered by the Tenderer upon the Schedule of Prices .

Should the Tenderer consider that he can offer any advantages to the Employer by a modification to the Specification he may draw attention to such by an attached document stating the change in the amount of his Tender if such modification is accepted by the Employer, but the total entered on the Form of Tender is to be such as represents compliance with the bound document.

5.2 No alteration is to be made in the Form of Tender or in the Schedules thereto except in filling up the blanks as directed.

If any such alterations are made or if these instructions are not fully complied with the Tender may be rejected.

The Tender however, is at liberty to add further details that he may deem desirable and, in the event of this so doing, must print or type such details and annex the added matter to the Tender submitted by him. Such additional details shall not be binding upon the Employer unless they are subsequently incorporated in the Contract

5.3 If after the receipt of Tender a discrepancy is found between the totals in the Schedules of rates and that obtained by adding the products of the quantities and rates, the Rates indicated in the Schedule shall govern, and any errors thus found shall be corrected by the Employer. The Tender sum so corrected shall be considered binding. If there is a

difference of price in writing and in numerals the amount shown in writing shall govern.

5.4 The Employer will not be responsible for, nor pay for, any expense or loss which may by incurred by a Tenderer in the preparation of his tender.

5.5 All correspondence in connection with this Tender and contract and all matter accompany the Tender which is relevant to its examination is to be in the English language and all quantities and dimensions are to be expressed in metric units .

5.6 The Tenderer shall state the Tender Price in his own currency or U.S. Dollars, except that portion of his price which he expects to spend in Jordan which shall be stated in Jordan Dinars. If, however, a substantial portion of the Tenderer's expenditure under the contract us expected to be in countries other than his own, he may state a corresponding foreign currency portion of the prices in the currencies of those other countries.

5.7 Tenderer's attention is drawn to the fact that this is a turnkey contract and as such the successful tenderer will be responsible for the overall design in accordance with the technical specification and schedules and to the approval of the Engineer and Employer. The complete cost of design, supply, installation and commissioning of all equipment and works for a satisfactory and safe working scheme is deemed to be included in the Tender Price, even if all individual items necessary have not been specifically mentioned in the tender documents .

6- TENDER AND PERFORMANCE BONDS

6.1 The tender shall be accompanied by a tender bond in the form of a bank guarantee (valid for at least 120 days) or a certified cheque in favor of and payable to the Employer for a sum equal to 5 percent of the total tender price, as a guarantee of good faith . The bond should be issued through a bank in Jordan.

The Tender Bond will be returned to unsuccessful Tenderers as soon as possible after awarding the contract. However, the Employer may at his discretion retain the Tender Bond until such time that the successful Tender has establishes a Performance Bond. In the case of the successful Tenderer, the Tender Bond will, subject to the

Conditions of Contract, be returned as soon as a performance Bond has been entered into.

Should a successful Tenderer fail, or refuse to execute the contract and / or to provide a Performance Bond to the Employer's approval within one month after receipt of the Letter of Acceptance the Tenderer will be considered to have abandoned his Tender and the amount of the Tender Bond lodged with the Tender shall thereupon be due and owing to the Employer as liquidated damages for such failure or refusal. The Employer may thereupon award the Contract to another Tenderer, who shall then be deemed to be the successful Tenderer.

6.2 The Tenderer shall enter in his tender the name or names of the Sureties, Insurance Company or Bank proposed for guaranteeing the performance of the Contract.

7- TENDER VALIDITY

The Tender is to be held open for acceptance or rejection for a period of four months from the date specified for the delivery of tenders.

8- WITHDRAWAL OF TENDERS

Tender may be withdrawn by official request received from the Tenderer prior to the time fixed for opening. If for any reason the tender should be withdrawn after the time fixed for opening and before expiry of the said period, the Employer has the full right to retain the full value of the Tender Bond.

9- ACCEPTANCE OF TENDER

The Employer does not bind himself to accept the lowest or any tender, nor to assign any reason for the rejection of any tender, nor to purchase the whole of the materials and plant specified.

10- SUBMISSION OF TENDERS

10.1 The tender is to be submitted in duplicate to:

THE GENERAL MANAGER
Irbid District Electricity Company Ltd.
P.O. Box 46 Irbid 21110
The Hashemite Kingdom of Jordan
E-mail:ideco@IDECO.COM.jo
Website:www.ideco.Com.jo
Fax. + 96227245495

Each copy of the tender shall consist of Volume 1 of the documents issued, filled up as directed, accompanying supplementary information, together with the drawings called for . One set shall be marked "Master Copy "and the other set "Duplicate Copy ".
The tenderer may retain for his records one copy of Volume 1 and Volume 2.

10.2 Each copy of the tender should be enclosed in a secure envelope endorsed "Replacement of Power Transformers for Irbid South and Irbid City Center Substations "but bearing no other mark from which the identify of the tender can be ascertained.

10.3 Both copies of the tender should be delivered by the time stated in the covering letter. No tender received after that time will be considered.

10.4 Should there be any discrepancies between entries in the Master Copy and Duplicate Copy, the entries in the Master Copy shall be deemed to be correct.

10.5 Tenders received prior to the time stated for opening will be securely kept, unopened. Tenders received after that time will be rejected. The Purchaser accepts no responsibility for premature opening of tenders not properly addressed or identified.

11- EVALUATION OF TENDERS

For the purpose of comparison of tenders, the exchange rates ruling in Jordan (as issued by the Central Bank of Jordan) on the tender closing date are used. However, should there be a change in the value of the currencies before the contract is awarded, the Employer may at his

discretion carry out a final comparison using the exchange rates ruling immediately before award is made .

12- FURTHER INFORMATION

Any further information may be obtained on application in writing to:-

THE GENERAL MANAGER
Irbid District Electricity Company Ltd.
P.O. Box 46 Irbid 21110
The Hashemite Kingdom of Jordan
E-mail:ideco@ideco.com.jo
Website:www.ideco.Com.jo
Fax. + 96227245495

THE HASHEMITE KINGDOM OF JORDAN
IRBID DISTRICT ELECTRICITY COMPANY LTD
Replacement of Power Transformers for Irbid South and Irbid City Center Substations
TENDER NO. 8/2016

FORM OF TENDER

To : The General Manager,

Irbid District Electricity Company Ltd

P.O. Box (46) Irbid 21110

Hashemite Kingdom of Jordan

E-mail: ideco@ideco.com.jo

Website: www.ideco.com.jo

Sir,

We hereby offer to supply, complete, deliver C.I.F. Aqaba, transport to the site, erect, place in commercial operation and test all the works described in the Specification in accordance with the Specification and Schedule, with the Drawings and with the other documents comprised in the Contract and to maintain the works in the manner therein specified and to perform all the obligations which are to be performed by the Contractor for the sum of .....
.....

And we hereby undertake to start delivery of the works described in the Specification to the Site within a period of ..... weeks from the date of your Order . Delivery of the whole of the works will be complete within ..... weeks from the date of your order.

And we also undertake to start erection of the works described in the Specification on the Site within a period of ..... weeks from the date of your Order. The whole of the works will be completely erected and ready for setting to work as Site within ..... weeks from the date of your Order .

The particulars and prices in the Schedules have been duly filled in by us so as to show the calculations on which this Tender is based and in accordance with which we agree to execute additional works and to have deductions made for works omitted. Our offer takes into consideration all additions and alterations to the Tender requirements up to and including Amendment Letter No, ... issued by the Engineer .

And we undertake, in the event of this Tender being accepted, to execute the Performance Bond referred to in Clause 9 of the General Conditions of Contract within one month of being called upon to do so.

And we further undertake, in the event of this Tender being accepted, to execute, if called upon to do so, an Agreement for the due execution of the works in the terms of the Agreement annexed here to.

And we further agree, in the event of our failure to execute such Contract within one month of its being left for execution at the address given below, that any acceptance of this Tender may be revoked by the Employer without prejudice to any other rights or remedies which he may have in respect of such failure .

DATED this day of 2016 .

Signed .....

Address .....

.....

APPENDIX TO TENDER

	Clause	Qualifying conditions
	=====	================
• Time for Completion	1	As stated in Schedules
• Amount of Bond or Guarantee (If any)	9	10%
• Additional Risks to be covered by Insurance	16.1	War Risks
• Delay in Completion (Contract completion)	31.1	
a. percentage to be deducted as damages		0.5% per week
b. maximum percentage which the deductions may not exceed		10%
• Period of Maintenance	33.1	18 months
• Percentage of Prime Cost items	38.2	10%

FORM OF TENDER BOND

BY THIS BOND WE .....
whose registered office is at .....
..... (hereinafter called " the Tenderer")
.....
whose registered office is at .....
and .....
whose registered office is at .....
(hereinafter called " the Sureties") are held and firmly bound unto the Irbid District Electricity Company Ltd. (hereinafter called "the Employer" in the sum of ..... for the payment of which sum the Tenderer and the Sureties bind themselves their successors and assigns jointly and severally by these presents .

Sealed with our respective seals and dated this ..... day of ..... 2016.

WHEREAS

1) The Employer has invited the Tenderer and other persons to complete Tenders in similar terms for the construction of works (hereinafter called "the works") and to submit the same for consideration by the Employer.
2) The Tenderer herewith submits to the Employer a Tender (hereinafter called "the Tender") in accordance with such invitation and has agreed by the above - written Bond to provide security for the due performance by him of the undertakings and obligations in the Tender on his part contained.

NOW THE CONDITIONS of the above-written Bond is such that:

1st) If the Tender is accepted by the Employer within (120) days from the ..... day of ..... 2016 and the Tenderer shall provide a surety or sureties in accordance with his undertaking in the Tender, or

2nd) If the Tender is not accepted by the Employer within (120) days from the ..... day of ..... 2016 or if before the expiration of that period of (120) days a tender from another person for the construction of the Works shall have been accepted by the Employer and that person shall have provided a surety or sureties in accordance with his undertaking in his Tender then this obligation

shall be null and void but otherwise shall be and remain in full force and effect but no alteration in the terms of the Tender nor any forbearance or forgiveness in or in respect of any matter or thing concerning the Tender on the part of the Employer shall in any way release the Surety from any liability under the above-written Bond .

SIGNED SEALED AND DELIVERED)
by the said) .....
)
In the presence of :) .....

THE COMMON SEAL OF
Was hereunto affixed in the presence of) .....

THE HASHEMITE KINGDOM OF JORDAN
IRBID DISTRICT ELECTRICITY COMPANY LTD
Replacement of Power Transformers for Irbid South and Irbid City Center Substations
TENDER NO. 8/2016

AGREEMENT

THIS AGREEMENT is made the day of One Thousand nine hundred and BETWEEN the Irbid District Electricity Company Ltd. P.O. Box (46) Irbid, The Hashemite Kingdom of Jordan (hereinafter referred to as "the Employer") of the one part and

whose registered office is at…… (hereinafter called "the Contractor ", which expression shall be deemed to include his successors or permitted assigns) of the other part .

WHEREAS the Employer desires to have supplied, delivered, trans.-ported, erected, set to work, tested, handed over and maintained certain Works mentioned, enumerated and referred to in the General Conditions referred to in Clause C hereof, Specifications, Schedules, Drawings and Schedule of prices (hereinafter called the "Works") and has accepted in the terms of letters dated the Tender by the Contractor for the supply and execution of the said Works, the said Tender being dated

AND WHEREAS the Contract Price is

AND WHEREAS the aforesaid Contract Price is subject to such additions thereto or deductions there from as may be made under the provisions of the Contract.

AND WHEREAS the Employer is prepared to agree to the Contractor supplying and executing the said works.

AND WHEREAS the Contractor has provided a Bond or Guarantee for the due and proper performance of the Contract in the sum of

and the terms of which Bond or Guarantee have been approved by the Employer .

NOW IT IS HEREBY AGREED AND DECLARED as follows, that is to say:-

1st) IN consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned the Contractor here by covenants with the Employer that the Contractor shall and will duly provide, deliver to Site erect , test, set to work, hand over and maintain the said works and shall do and perform all other acts and things in the Contract mentioned or described or to be implied therefrom or may reasonably be necessary for the completion and maintenance of the said works within and at the times and in the manner and subject to the terms and conditions mentioned herein .

2nd) AND in consideration of the due provision execution construction and completion of the said works the Employer does hereby covenant with the contractor that he the Employer will pay to the contractor the said sum of

or some other sum as may become payable to the contractor under provisions here of such payments to be made at such time and in such manner as is herein provided .

3rd) IT IS HEREBY AGREED AND DECLARED that the General Conditions of Contract annexed hereto (hereinafter referred to as "the General Conditions") with the other documents referred to therein shall be incorporated in and form part of this Contract and the words and expressions in this Agreement shall have the same meanings as are respectively assigned to them in the aforesaid General Conditions .

IN WITNESS whereof the parties hereto have hereto set their respective hands and seals this day and year first above written.

SIGNED SEALED AND DELIVERED BY)
for and on behalf of the Contractor in)
the presence of :)

SIGNED SEALED AND DELIVERED FOR)
AND ON BEHALF OF THE IRBID DISTRICT)
ELECTRICITY COMPANY LTD.)
In the presence of :-)

FORM OF ADVANCE PAYMENT GUARANTEE

Whereas the Irbid District Electric Company Ltd. P.O . Box (46), Irbid, The Hashemite Kingdom of Jordan, (hereinafter called "the Employer" has entered into a contract on with ..... whose registered office is (hereinafter called "the Contractor") for the construction of contract 8/2016 for the Tender Sum of ..... and will grant the Contractor an advance payment of ten per cent of the Definite Work value of the Contract within 30 (thirty) days from the receipt of this guarantee representing a total .... we, ... whose registered office is ..... (hereinafter called "the Surety") hereby irrevocably guaranteed to repay to the Employer An amount advanced to the Contractor in a sum not exceeding ..... or an equivalent amount in ..... calculated at the tender rate of .....on the first demand if the Contractor becomes bankrupt or against written certification by the Engineer, that the Contractor has failed to commence the works, within a reasonable period of the receipt of the order to that he has not repaid the advance payment or part thereof in accordance with the terms of the Contract or that the contract is forfeited under clause (42) of the Conditions of the Contract .

This guarantee shall come into force on receipt of the advance payment by the Contractor and shall be reduced by the amounts repaid by the Contractor as contractual redemption of the advance amount.

The guarantee shall, however, expire on ..... at the latest by which date any claims may have been received by us by registered letter.

This guarantee shall be construed and take effect according to the laws for the time being in force in Jordan.

It shall be deemed agreed that you will return this guarantee to us on expiry or on complete redemption of the advanced amount.

IN WITNESS WHEREOF the common seal of the Surety is hereunder affixed.

THE COMMON SEAL OF)
was hereunto affixed in the presence of :-)

Dated this ..... day of ..... 2016.

MODEL FORM OF PERFORMANCE BOND

REFERRED TO IN THE AGREEMENT

KNOW ALL MEN BY THESE PRESENTS that we whose Registered Office is situated at .... and ..... whose Registered office is situated at ..... are firmly bound to ..... of ..... (hereinafter referred to as "the Employer") in the penal sum of ..... of lawful money of ..... such sum to be paid to the Employer at ..... aforesaid for which payment to be well and truly made we bind ourselves and each of us and the successors of each of us jointly and severally by these presents

SEALED with our seals

DATED the..... day of 2016

WHEREAS by the Contract bearing even date with the above Bond and made between the Employer of the one part and the above bounded

(herein and hereinafter called "the Contractor") of the other part the contractor has contracted and agree that the Contractor will in such manner within such periods and to such satisfaction provide construct execute complete and maintain such works as in the said Contract are mentioned and will perform the other obligations imposed on the contractor by the said contract .

And whereas before and as one of the terms upon which the said contract was made it was expressly agreed between the parties there to and *

that the contractor and *
as Surety for the contractor, should enter into the above written Bond conditions as hereunder mentioned .

Now the condition of the above written Bond is such that if the contractor shall well and truly perform and observe all the agreements conditions and stipulations which under or by virtue of the said contract or any award made under the provisions therein continued ought on his part to be performed on observed and shall from time to time and all times hereafter at his own cost and charge save harmless and keep indemnified the Employer from all actions suits losses charges damage and expenses which the Employer shall or may bear sustain or incur for or by reason of the non-observance or non-performance of breach of any of the said agreements and stipulations in the said contract continued or referred to and on the part of the contractor to be performed or observed then the above written bond shall be void or otherwise shall remain in full force or effect .

PROVIDED ALWAYS AND IT IS HEREBY DECLARED that all the rights and remedies of the employer under the above written bond are to be deemed cumulative and in addition to and not in substitution for his rights and remedies under the said contract and that the rights of the employer against *

and their successors shall not be prejudiced or affected by any alteration which May be made Agreement between the parties to the said contract in the terms thereof or the nature of the work to be executed or obligations to be performed there under or by time being granted to be contractor or by any outer indulgence or forbearance towards the contractor in connection with the said contract which but for this provision might release the said surety from liability under the said bond.

THE COMMON SEAL OF)
)
was hereunto affixed in the presence of :-)

Director

Secretary

THE COMMON SEAL OF)
)
was hereunto affixed in the presence of :-)

The names of both Contractor and Surety to be inserted here .

SCHEDULE A

SCHEDULE OF REQUIREMENTS

General

This Schedule details the main items of plant to be provided and works to be carried out under this contract, but the tenderer is required to ascertain for himself whether any additional plant or works are necessary to leave the substation complete and in working order on completion of the contract in accordance with the specification and tender drawings . Any such additional plant or works are deemed to be included in the prices quoted in the Schedules.

To complete each item of plant and equipment detailed in this schedule there shall be provided all necessary oil, gas, cabling, cable boxes, terminal boards, protective relays, panels for control equipment, supporting steelworks, panel wiring, fuse links, interlocking, gear, motors, auxiliary contacts, holding down bolts, screen guards, labels, auxiliary and control cables and all necessary miscellaneous items whether specified in detail or not.

For convenience, the main system parameters, sits conditions and completion dates are given in the table on page A-3 this is followed by the detailed requirements which are listed in sections that are numbered to correspond with the appropriate section numbers of the technical specification.

* Details of equipment reference number system

The equipment reference numbers used in this schedule are composed as follow:-

Specification section number (suffix if appropriate) / item serial number. for instance, the second item listed for Section 4 of the works has the reference 4.2.For convenience the specification section numbers are listed below :-

Section of Specification	Section Number
==========	

Summary of Main System Parameters, etc and completion date.

Three second short circuit rating (KA) for 33kv Switchgear	25
Three second short circuit rating (KA) for 11kv Switchgear	31.5
Busbar current rating (A) for 33 Kv Switchgear	1250
Busbar current rating (A) for 11 Kv Switchgear	2000
Power frequency withstand voltage (Kv) for 33Kv Switchgear	70
Power frequency withstand voltage (Kv) for 11Kv Switchgear	28
Impulse withstand voltage (Kv) for 33Kv Switchgear	170
Impulse withstand voltage (Kv) for 11Kv Switchgear	75
Insulator creepage distance (mm / Kv) for outdoor equipment	33
Site Altitude (m) for Irbid City Center S/S	568
Site Altitude (m) for Irbid South S/S	613
Design ambient temperature (C)	50

Highest average daily temperature (C)	32
Required completion date from Contract Award	(9) months

SCHEDULE A

Section 1: Civil works, lighting and small power.

Item No.	DESCRIPTION
	Refer Schedule M for details. Complete civil works, transformers foundation, lighting and small power installation for the transformers to meet the requirements of section 1 of the technical specification.

SCHEDULE A

Section 2:	Transformer

Item No.	DESCRIPTION
2.1	Tow 25 MVA 33/11 Kv Transformers in each substation (Irbid south & Irbid city center). No. of Phases - 3 Cooling - ONAN/ONAF Rating - 20 / 25 MVA Voltage Ratio - 33/11 Kv Vector group - Dyn1 Range of transformation ratio, HV/LV + 10% to -15% Size of transformation ratio steps 1.25% Type of transformation ratio control: On-load Winding to be tapped for ratio control: HV Normal voltage operating range, HV: +10% to -5% Normal voltage operating range, LV: +10% to -10% Cooling radiator mounting: Separately 33Kv Termination: Cable Box with disconnecting chamber. 11Kv Termination: Cable Box with disconnecting chamber. 11Kv neutral: cable box. Impedance voltage at CMR, 75 C: 12.5% nominal. Allowable tolerance on impedance voltage: centre tap $\pm$ 5% on nominal Fittings required with transformer : Winding temperature indicator/relays (2 required) Oil temperature indicator/relay . Main conservator with oil level indicator and low oil level alarm . Tap changer conservator with oil level indicator and oil level alarm (if applicable to design of tap changer) . Gas and Oil operated relay (Buchholz relay). Tap changer surge relay (if applicable to design of tap changer). Thermometer pocket. Silica gel breather for each conservator

SCHEDULE A

Section 2:	Transformers

Item No.	DESCRIPTION

Pressure relief device
Rating plate
Diagram plate
Valve plate
Property plate

Complete set of valves for draining, sampling, filtering, air release, cooler, radiator and conservator isolation, etc.
Tap changer L.D.C. and overload CTs

Marshalling cabinet, containing
All temperature indicator/relays
Cooler control gear

Local control gear for on-load tap changer, including local ñraise/lowerò control switch and ñremote/localò control selector switch (note - depending on the make and design of tap changer this equipment may be incorporated in tap changer driving mechanism chamber) .

Auxiliary supply disconnectors (for coolers, tap changers)
Terminals for marshalling all multicore cables from remote control and relay panels
230V ac switch socket
All necessary fuses, trip switches, heater, light, labels, wiring, test facilities, relays, contactors, etc, needed to complete the successful instalation and parallel operation.

The Tenderer must be deemed to have visited the substation to study the existing scheme of the parallel operations between the existing power transformers in each substation to provide the suitable design to be operated in parallel mode successfully .

SCHEDULE A

Section 2:	Transformers

Item No.	DESCRIPTION
2.2	Two current transformers for Irbid city center Transformers, Ratio 1200/1 A for restricted earth fault protection, shall match the existing current transformers in 11 Kv switchgear and applicable for restricted earth fault protection. Tenderer must supply and install of all requirements necessary to complete the successful operation of the restricted earth fault protection.

Section 3 : Terminations for 33 Kv and 11Kv Transformers cables

Item No.	DESCRIPTION
3.1	Supply all terminations required for 33Kv and 11 Kv sides of the transformers.

Section 4 :	Cables

Item No.	DESCRIPTION
	CABLES ON LUMP SUM BASIS
4.1	Complete set of multicore control cables, low voltage auxiliary cables and terminations, etc, for all equipment detailed elsewhere in these schedules and the technical specification, including thoses necessary for items associated with the transformer . Cables to be 1000 volt grade, stranded copper conductor, with PVC insulation, type CQxWQx .

SCHEDULE B

DRAWINGS

1 TENDER DRAWINGS

The following drawings form a part of this Specification:-

Drawing No.	Title
8/2016/ICC1	Map and site location
8/2016/ICC2	Proposed arrangement of 33/11Kv substation
8/2016/IS1	Map and site location
8/2016/IS2	Proposed arrangement of 33/11Kv substation

Note: The above drawings are not intended as final construction drawings. The successful tenderer will be responsible for producing all drawing for construction purposes and will be responsible for ensuring that all necessary safety clearances, working loads, etc. are correct. All necessary supports, structures, etc, required to complete the schemes are to be included where necessary whether or not they are shown on the above tender drawing.

2 DRAWING SUBMITTED WITH TENDER

The following drawings are to be submitted with Tender:

a) Drawings of circuit breakers, current transformers, voltage transformers and isolators showing general details of construction and dimensions.
b) Drawing (plans, elevations and section) of civil works.

SCHEDULE C

BASIC DESIGN PRINCIPLES AND DIMENSIONS

For convenience certain basic design principles and dimensions are listed below (if found possible to be applied). This is not an exhaustive list and reference should also be made to the Technical Specification and other Schedules as appropriate. The Contractor is required to take into consideration the dimension listed below if it was possible.

1 **Minimum dimensions for equipment etc in buildings:**

(a) Rear of panel/equipment to adjacent wall - 1.0 meter (Except for items intended for ñback to wallò mounting).

(b) Rear of panel/equipment to front of adjacent panel/equipment 1.5 meters.

(c) Front of panel/equipment to front of other panel/equipment when facing each other - 2.0 meters.

(d) Any outer part of enclosed switchgear, motor or generator on own base plate to wall or other equipment - 1.0 meter .For switchgear which may be withdrawn from its housing, this dimension shall be taken from the front of the truck in its fully withdrawn position

(e) Safety clearances - according to B.S. 162.

SCHEDULE D

SCHEDULE OF TESTS

1- GENERAL TEST REQUIREMENTS

Test shall include all routine, electrical, mechanical and hydraulic tests in accordance with the relevant Standards and in addition any tests called for by the Engineer to ensure that the plant being supplied meets the requirements of the Specification. The costs of all test including the provision of the necessary test equipment whether at the manufacturerôs works or in site shall be borne by the Contractor and shall be deemed to be included in the Contract Price.

Not less than 10 working days notice shall be given to the Engineer when plant is ready for test. (See Clause 11.1 of the Technical Specification).

The Contractor shall supply three copies of all test certificates.

Type tests are not required if the Contractor can submit satisfactory evidence that type tests have been carried out on similar equipment.

After satisfactory completion of the witnessed tests at the works, the plant shall be submitted for approval during dismantling prior to shipping. No item of plant shall be dispatched to Site until the Engineer has given his approval in writing.

2- TRANSFORMERS ASSOCIATED EQUIPMENT

2.1 WORKS TEST

2.1.1 Insulators

Routine, Sample and Type Test to IEC 62155 and IEC 60168.

2.1.2 Structures

Mechanical Type tests loading with working load times appropriate factor of safety.

Sample assembly test and galvanizing tests.

2.1.3 Current and Voltage Transformers

Routine tests to IEC 61869 part (1, 2&3).
Type tests to IEC 61869 part (1, 2&3) including impulse tests.

2.1.4 Surge Arresters

Routine and type tests to IEC 60099-5 including impulse withstand test to this standard or to IEC 60156, 1995 including low duration current impulse test for heavy duty arresters.

2.1.5 Auxiliary Transformers, Motors, Generators, Rectifiers, Contactors and Control Gear

To the appropriate IEC latest Recommendation or as required by this Specification.

2.1.6 Protective Relaying Equipment

Routine tests to IEC 60255 or other relevant IEC latest Recommendation and checking of correct operation of all relays as appropriate.

Routine testing of sets of differential protection current transformer.

Where required by the Engineer, type tests shall be made on each type of protective scheme simulating service conditions as closely as possible, to prove sensitivity, stability and operating times .

2.1.7 Control and Indicating Panels, Instruments, Wiring, Metering Equipment etc.

Routine tests as the appropriate IEC Recommendation. Secondary wiring test at 2KV for 1 minute.

2.1.8 Handling Devices and Lifting Tackle

All handling devices and lifting tackle supplied for maintenance purposes under the Contract shall, unless they are built into and from part of the equipment, be tested and marked and certificates of test shall be provided.

Lifting tackle built into and forming part of the equipment shall be operated with maximum working load to the satisfaction of the engineer.

2.2 SITE TESTS

2.2.1 Soil Resistivity

Soil Resistivity Test and Electrode and Earthing system tests as Clause 7.6.

2.2.2 Routine High Voltage Tests

Routine high voltage tests to the Engineerôs approval.

2.2.3 Insulation Resistance Test

2.2.4 Continuity Tests

To prove correct operation of interlocks, tripping and closing circuits, indications etc.

2.2.5 Functional Tests

2.2.6 Insulating Oil and Gas Tests

2.2.7 CT Test

Magnetization curves and polarity checks on all current transformers.

2.2.8 Phasing Tests

Vector group, phasing and synchronizing tests.

2.2.9 Relay Tests

Operation of all protective gear circuits by primary and secondary injections and, where necessary, system fault tests to check sensitivity and stability. Secondary injection of relays to enable their characteristic to be determined to the satisfaction of the Engineers.

2.2.10 Alarm Tests

Test operation of alarm devices.

2.2.11 Motor Tests

Rotational tests on all motors.

3- PVC INSULATED POWER AND CONTROL CABLES

3.1 WORKS TESTS

All PVC insulated copper or aluminum conductor cables, with or without galvanized steel wire or aluminum strip armour, shall be subjected to all the tests at works specified in latest IEC standards

3.2 SITE TESTS

3.2.1 High Voltage Test

Each complete circuit of cable shall be subjected to a direct current high voltage test.

For cables installed in a 3-phase 230/400V, 50Hz system, the test may be applied with a 2000V megger insulation tester.

For other cases, the voltage test shall be in accordance with latest IEC standards.

3.2.2 Resistance Test

The conductor resistance of each core of each completed circuit which includes through joints shall be measured and recorded. The measured values shall not be greater than the values stated in the Schedule of Particulars and Guarantees when corrected to 20C and with suitable adjustment for the length of the route.

4- ELECTRICAL AND MECHANICAL SERVICES

4.1 GENERAL

Tests shall be taken on each part of each Section, on completion of the installations, in the presence of and to the satisfaction of the Engineer at a date and time mutually agreed. The Contractor will provide the necessary labour, apparatus, connections and instruments for the test but the equipment used and the method of tests will be to the approval of the Engineer.

The Contractor will maintain a record of all installation tests carried out on the complete installation and shall furnish four copies of a schedule of the results in an approved form to the Engineer.

4.2 ELECTRICAL SERVICES

Switchgear and cables shall be tested in accordance with the relevant IEC standards equivalent.

The final circuit or sub-circuit of each installation shall be tested for insulation resistance from the terminals of the switch or fuse board controlling the circuit. Polarity test shall be taken from all single pole switches to ensure that they are connected in the line or phase conductor. Earth continuity tests shall be taken as required be the Engineer.

Any circuit or section of the works failing to comply with any of the tests shall be made good by the contractor without extra charge to the contract.

Minimum standards of acceptance shall generally be as follows:-

1- Insulation resistance for lighting installations taken before tungsten lamps or fluorescent tubes are connected - 20 megohms divided by the number of points, between the conductors and both conductors to earth.

2- Insulation resistance for lighting installations after fitting containing chokes have been connected - 2 megohms divided by the number of chokes in the circuit to earth.

3- Insulation resistance for small power circuits excluding the connected apparatus - 20 megohms per circuit between conductors and between all conductors to earth.

4- Earth conductivity (not including the neutral connection) from the furthest point on any lighting or power circuit to the Earthing point on the system - 1 ohm .

The above figures may be varied in accordance with the ñRegulations of the Electrical Equipment of Buildingsò for the appropriate type of installation to the approval of the Engineer.

4.3 MECHANICAL SERVICES

After completion of each and every section of the works, the Contractor shall, as and when directed by the Engineer arrange to demonstrate to him that the installations are adjusted and regulated correctly to fulfill the function for which it has been designed, e.g. air quantity to be handled, etc., and the contractor shall adjust, balance and regulate the section concerned as necessary until the required conditions are obtained before calling upon the Engineer to witness the performance.

The duration of the tests will be at the discretion of the Engineer and all recording charts shall be submitted to him for approval.

4.3.1 The contractor shall provide a complete set of testing equipment.

The whole of the instruments, equipment and labour required for conducting these tests and demonstrations shall be provided by the contractor and the cost thereof included in the tender amount. At all times the test instruments and equipment shall remain the property and responsibility of the contractor.

5- TRANSFORMERS

Routine tests

All transformers are to be subjected to the routine tests specified in IEC 60076, including measurement of zero phase sequence impedance where required.

Type Tests

1. **The temperature rise tests:** The temperature rise tests in accordance with IEC 60076 shall be carried out on one transformer of each size and type. Temperature tests are to be conducted on the tapping corresponding to the maximum losses.

   High voltage and over potential tests are to be applied immediately after the conclusion of the temperature test. Duplicate transformer units not subjected to a temperature test are to be heated to normal working temperature by any convenient method and the high voltage and over potential tests are to be applied immediately after this temperature is reached.

2. **Impulse type tests are to include for the following requirements:-**

   Procedure is to be as required by IEC 60076 except that the winding on the centre limbs are to be tested and negative polarity is to be used throughout the tests. The transformers selected for impulse tests are to

   have been fully tested and such tests shall have included iron loss measurements, high voltage and over potential tests .

The procedure shall be as required by IEC60076-3 the impulse test voltages being applied successively to each line terminal.
Negative polarity is to be used throughout the tests.

Oscillographic records of the applied voltage and neutral current and/or transferred voltage are to be taken and included in the records.
Films of the Oscillographic records are to be made available to the Engineer at the time of the tests for his examination.

External flashover of the bushings during the chopped wave tests is NOT permitted.

At the conclusion of the impulse application, the transformer is to be subjected to iron loss measurements, high voltage and over potential tests.

3. Measurement of dissipation factor (tan δ) of the insulation system capacitances.

Special Tests

1. ***9 asymmetrical shots and a 3 seconds symmetrical shot short circuit test certificate should be submitted according to IEC standard from one of the following testing laboratories (KEMA or CESI or IPH).***
2. ***Dissipation factor.***
3. ***Insulation resistance.***
4. ***Capacitance.***
5. **Zero phase sequence impedance measurement**.

These tests shall be in accordance with IEC 60076 and tests numbered (2-5) above, shall be carried out on 10% of transformers.

All tests results must be to the approval of the Engineer.

6- TRANSFORMER VOLTAGE CONTROL EQUIPMENT TO BSI BS EN 60214-1

Routine Tests The completely assembled switching apparatus is to be operated forty times through a complete tap changing cycle in the normal manner with the transformer unexcited followed be ten similar operations in the normal manner with the transformer alive at normal voltage on open circuit, all to the satisfaction of the Engineer .

NOTE: A complete tap changing cycle is to comprise movement from minimum to maximum and return to minimum tap, or equivalent.

Type Tests To comprise:-

(a) High voltage tests between Contacts and Tapping Connections half normal service voltage across the terminals of the higher voltage windings is to be applied for one minute between adjacent contacts of the switching apparatus and between tapping connections while immersed in oil at 90C and disconnected from the transformer windings.

(b) Duty Cycle - The completely assembled switching apparatus is to be operated through 500 complete cycles without failure or undue wear on any part.

(c) Contract Heating - Each switch on all contacts is to carry ten times its full rated current for a period two seconds five times in succession without damage or injurious heating and without signs of excessive burning.

(d) Timing - a test to show the exact time sequence of the various parts of the on-load voltage control equipment.

7- TRANSFORMER MAGNETIC CIRCUIT

Routine Tests Each core completely assembled is to be tested for one minute at 2,500 volts A.C. between core bolts, side plates, structural steelworks and at the core and coils stage. After the transformer is tanked and completely assembled, a further test is to be applied between the core and the earthed structural steelworks to prove that the core is earthed, through the removable link, at one point only as required by subsection 6.4.4.

8- TRANSFORMER CABLE BOXES AND DISCONNECTING CHAMBERS

Routine Test To meet the requirements of Clause 6.10.2

9- TRANSFORMER TANKS

Routine Tests

(a) Oil leakage - All tanks, conservators and oil filled compartments which are subjected in service or during maintenance to oil pressure are to withstand without leakage, a hydraulic pressure test equal to 69 KN/m2 (10 p.s.i.g) or the normal pressure plus 34.5KN/m2 (p.s.i.g), whichever is the greater, for 24 hours during which time no leakage or oil ingress into normally oil free spaces shall occur.

Unless agreed otherwise, the hydraulic test pressure for distribution transformers shall be 17KN/m2.

Type Test Unless Type Test Certificates can be produced for tests carried out on similar equipment, the following tests are to be included for tanks, conservators and pressure relief devices.

(a) Vacuum Test The equipment is to withstand a vacuum of 508mm (20 inches) of Mercury (69KN/m2) (10 p.s.i.g) less than atmospheric pressure when empty of oil . The permanent deflection of plates or stiffeners or removal of vacuum is not to exceed the following values:-

Length of Plate	Permanent Deflection
Less than 1300 mm	3.17 mm
1300 to 2500 mm	9.5 mm
Greater than 2500 mm	12.7 mm

Unless agreed otherwise, tanks of distribution transformers shall withstand without permanent deformation a vacuum of 127mm of mercury when empty of oil.

(b) Pressure Test — The equipment is to withstand a pressure corresponding to (69KN/m2) or the normal pressure plus (34KN/m2) whichever is the greater. The permanent deflection of plates or stiffeners on removal of pressure is not to exceed the values stated in respect of the vacuum test in the proceeding paragraph.

Unless agreed otherwise, tanks of distribution transformers shall withstand without permanent deformation a pressure corresponding to (17KN/m2)

10- TRANSFORMER COOLING PLANT

Routine Tests

(a) Coolers - Pressure test is to be as specified in Section 10` above .

(b) Oil pumps, Oil Pipe Work and Values - a hydraulic withstand pressure of 138KN/m2 (20 p.s.i.g) for 15 minute.

(c) Motors and Control Gear - to the requirements of Clauses 0.54 and 0.55.

(d) Temperature Rise Test

11- GAS AND OIL-ACTUATED RELAYS

Routine Tests

(a) Oil leakage - when subject to an internal oil pressure of 207KN/m2 (30 p.s.i.g.) for 15 minutes.

(b) Gas Collection

(c) Oil Surge

(d) Voltage - 2KV for one minute between electrical circuits and casing.

12- TRANSFORMERS - SITE TESTS

All apparatus, instruments and connections for the test after the completion of the erection work on site shall be provided by the contractor. The following tests shall be performed:-

(A) Insulation resistance tests on bushings.

(B) Insulation resistance test at 500V d.c. between core and core clamping structure.

(C) Voltage withstands tests on transformer oil to IEC. 60296.

(D) Ratio

(E) Phase relationship.

(F) Magnetisation characteristics of current transformers of winding temperature devices.

(G) Calibration of winding temperature devices.

(H) Tap selector and Diverter Switch alignment.

(I) Calibration of automatic voltage control equipment.

(J) Magnetisation characteristics and polarity tests on current transformers where provided and installed in terminal bushing under this contract.

(K) Buchholz relay operation test.

(L) Tap changer operation test.

SCHEDULE E

GUARANTEES AND TECHNICAL PARTICULARS

EQUIPMENT

This schedule is to be completed by the contractor at the time of tendering and the particulars and guarantees entered will be binding. No departure from these particulars and guarantees will be allowed except with the written permission of the engineer.

Full details of the known site conditions (ambient temperature, altitude, etc.) are given in the technical specification and the main requirements are summarized at the beginning of schedule A.

SCHEDULE E (Continued)

(1) TRANSFORMER

Item		Particulars Power Transformer
Number required		1
No. of phase		3
Max. continuous rating (ONAN)	MVA	
continuous rating (ONAF)	MVA	
Normal ratio of transformation	Kv	
Vector Group Reference to latest IEC.60076		
Type of cooling		
Type of transformation ratio control		
Range of transformation ratio variation HV/LV	per cent	
Size of transformation ratio steps	per cent	
Manufacturer and type of tap changer		
Normal operating voltage range :-		
High voltage system	per cent	
Low voltage system	per cent	
Whether HV or LV winding tapped		
Supply voltage for control circuits	V.DC	
AVR reference voltage	V.AC	
Phase connections :-		
HV winding		
LV winding		

SCHEDULE E (Continued)

(1) TRANSFORMER (Continued)

Item		Particulars Power Transformer
Terminal arrangements : HV winding LV winding		
Whether hot or cold rolled steel core		
Thickness of laminations		
Maximum flux density at normal volts, frequency and ratio	TESLA	
Simultaneous operating condition for maximum Flux density (see clause 6.2.2.)		
(a) Frequency	Hz	
(b) Voltage HV	Kv	
(c) Voltage LV	Kv	
(d) Tap		
(e) Load and Power factor	MVA/p.f.	
Maximum flux density under above conditions	TESLA	
R.M.S. Exciting current at normal voltage on principal tap (HV side)	amps	
R.M.S. Fundamental exciting current	amps	
R.M.S. 3rd Harmonic current	amps	
R.M.S. 5th Harmonic current	amps	
R.M.S. 7th Harmonic current	amps	

SCHEDULE E (Continued)

(1) TRANSFORMER (Continued)

Item		Particulars Power Transformer
Maximum current density in windings at C.M.R. on normal tap :-		
(A) HV Windings	amps/mm2	
(B) LV Windings	amps/mm2	
No load losses at normal ratio	KW	
Load loses at C.M.R. 75 C and normal ratio (excluding cooling plant)	KW	
Total power consumption of cooling plant	KW	
Tap position on which maximum loses occur at C.M.R.		
Load losses at C.M.R. on tap position with maximum losses	KW	
Total losses at C.M.R., 75 C, when operating on tap position giving maximum losses	KW	
Efficiency at :		
Full load Unity P.F.	per cent	
Full load 0.8 P.F.	per cent	
3/4 Full load unity P.F	per cent	
3/4 Full load 0.8 P.F.	per cent	
1/2 Full load unity P.F.	per cent	
1/2 Full load 0.8 P.F.	per cent	
1/4 Full load unity P.F.	per cent	
1/4 Full load 0.8 P.F.	per cent	

SCHEDULE E (Continued)

(1) TRANSFORMER (Continued)

Item	Particulars Power Transformer
Regulation at 75 C and C.M.R. :-	
At Unity P.F. (per cent	
At 0.8 P.F. lagging (of normal	
(volts	
Impedance voltage at 75 C and C.M.R. at normal ratio :-	
Between HV and LV winding approx. per cent	
Impedance voltage at 75 C and C.M.R. between :-	
HV and LV windings at highest transformation ratio per cent	
HV and LV windings at lowest transformation ratio per cent	
Temperature rise of windings at C.M.R. above specified design ambient C°	
Temperature rise of top oil at C.M.R. above specified design ambient C°	
Temperature rise of core at C.M.R. and rated voltage C°	
Type of winding :-	
HV	
LV	
Insulating material of windings :-	
HV	
LV	

SCHEDULE E (Continued)

(1) TRANSFORMER (Continued)

Item		Particulars Power Transformer
Type of insulating paper		
Insulation of tapping		
Insulation of tapping connections		
Insulation of core bolts		
Insulation of laminations		
Type of coil supports :-		
Axial		
Radial		
Type of material used for gaskets and joints		
Cooling surfaces :-		
(A) Total cooling area	mm2	
(B) Total external area of cooling tubes	mm2	
Number of radiators per transformer		
Cooling surface of each radiator pair	mm2	
Temperature gradient transformer oil at C.M.R. (between cooler inlet and cooler outlet)	C°	
Maximum oil pressure in system and position	KN/m2	
Time for winding hot spot temperature to reach 150 C on loss of coolers following operation at C.M.R.	mins	
Quantity of oil in transformer (tank and conservator)	liters	
Speed of air blowers	rpm	
Full load rating of each air blower motor	bhp	

SCHEDULE E (Continued)

(1) TRANSFORMER (Continued)

Item		Particulars
		Power Transformer
Voltage for air blower motor	V	
Starting current of each blower motor	amps	
Efficiency of blower motor at full load rating	%	
Power factor of blower motor at full load rating		
Maximum pressure of oil at the inlet to cooler under service condition	KN/m2	
Velocity of oil through cooler	mm/sec.	
Friction head across oil side of cooler	mm of oil	
Cooler surface of each cooler	mm^2	
Length between cooler tube plates	mm	
External diameter of cooler tubes	mm	
Number of air blowers per transformer		
Total power consumption of cooling plant at C.M.R.	KW	
Quantity of oil in tap changer	litres	
Quantity of oil in coolers	litres	
Total oil required (including coolers)	litres	
Total volume of conservator tank	litres	
Volume of oil in conservator between high and low level marks	litres	

SCHEDULE E (Continued)

(2) (A) AUXILIARY POWER CABLES

Description			Type					
Voltage		volts						
Number of cores			2	4	4	4	2	4
Conductor	(Cross section area	mm2	16	35	16	185	6	6
	(Material							
Insulation	(Type							
	(Minimum radial thickness	mm						
ARMOUR	(Type							
Bedding	(Nominal thickness	mm						
ARMOUR	(Type of wires							
	(Number of wires							
	(Diameter of wires	mm						
Outer	(Material							
Covering	(Minimum average thickness	mm						
Completed	(Overall diameter	m						
Cable	(Weight per meter	kg						
	(Maximum drum length	m						
Mean electrostatic capacity of each conductor to earth per km of completed cable		pF						
Minimum radius of bend around which cable can be laid		mm						
Maximum dc resistance of conductor per km of cable at 20 C		ohm						

SCHEDULE E (Continued)

(2) (B) AUXILIARY POWER CABLES

Description			Type						
Voltage		volts							
Number of cores			2	4	7	12	19	27	37
Conductor	(Cross section area	mm2	____	____	____	2.5	_____	_____	____
	(Material								
Insulation	(Type								
	(Minimum radial thickness	mm							
ARMOUR	(Type								
Bedding	(Nominal thickness	mm							
ARMOUR	(Type of wires								
	(Number of wires								
	(Diameter of wires	mm							
Outer	(Material								
Covering	(Minimum average thickness	mm							
Completed	(Overall diameter	m							
Cable	(Weight per meter	kg							
	(Maximum drum length	m							
Mean electrostatic capacity of each conductor to earth per km of completed cable		pF							
Minimum radius of bend around which cable can be laid		mm							
Maximum dc resistance of conductor per km of cable at 20 C		ohm							

SCHEDULE E (Continued)

(3) 11Kv CURRENT TRANSFORMERS

Apparatus Connected	Type	Ratio	Rated Output VA	Accuracy Class	Rated Short Time Thermal Current 3 second KA	Rated Accuracy Limit Factor	knee-point Voltage	DC Resist-ance
31.5MVA 33/11Kv Transformer : 1) Differential protection and LV restricted earth fault protection 2) LV restricted earth fault protection (neutral)								

SCHEDULE F

CIVIL WORKS PROPOSALS

The Tenderer shall list below the principal details upon which his tender is based. Important items not listed under the item column shall be entered in the blank lines. If the Engineer should reject any materials or finishes as being unsuitable, no claim for additional costs will be considered unless the item is entered in the schedule. If any item is not acceptable, the tender should write ñNONEò.

SCHEDULE F

ITEM	PROPOSAL
A DESIGN AND CONSTRUCTION - GENERAL	
1 Standards/Codes on which Designs are based.	
N.B. Failure to complete here will be taken as a proposal to use the standards and codes given in section 1 of the specification	
2 Type of Foundation and Estimated Allowable Bearing capacity for spread foundations.	
3 Program for civil works (to be submitted as separate enclosure with Tender)	
4 Sub-Contractor for Civil Design (**name & classification)**	
5 Sub-Contractor for Civil Contraction **(name & classification)**	
6 Sub-Contractor for Piling (if any)	
7 Sub-Contractor for Sub-soil investigation and testing	

SCHEDULE F (Continued)

ITEM	PROPOSAL
B DESIGN AND CONSTRUCTION STRUCTURAL STEELWORKS (IF APPLICABLE) 1 National Design Code 2 National Workmanship Code 3 National Standard for Steel 4 Grades of Steel 5 Suppliers of Steel 6 Suppliers of Bolts and Fasteners 7 Corrosion Protection for Bolts and Fasteners 8 Standard for Structural Sections 9 Code for Welding Procedures 10 Methods for Welding 11 Manufacturer of Electrodes 12 Work Item to be Welded on Site C DESIGN AND CONSTRUCTION PROTECTION OF STRUCTURAL STEELWORKS (All work to comply with BS 5493:1977) or latest relevant BS. 1 PROPOSED SURFACE PREPARATION * Method and Materials * Standard of Finish * Place of Preparation * Before or after fabrication? * Prefabrication primer and dry film thickness * Delay until subsequent coating	

SCHEDULE F (Continued)

ITEM	PROPOSAL		
	Coating 1	Coating 2	Coating 3
2 PROPOSED COATINGS (Refer clause 1.10.10)			
a) Type of product			
b) Manufacturer			
c) Dry Film Thickness			
d) Means of Application			
e) Place of Application			
f) Before or after Erection?			
g) Colour			
h) Delay to next coating			
i) Minimum delay recommended by manufacturer			
3 TRANSPORT TO SITE			
e.g. road, sea (deck), sea (hold) etc.			
D DESIGN AND CONSTRUCTION CONCRETE			
1 National Design Code			
2 National Workmanship Code			
3 Materials Standards :- a- Cement b- Aggregates c- Exceptions to Clause 1.10.3 d- Concrete Admixtures (if any) e- Reinforcement f- Other			

SCHEDULE F (Continued)

ITEM	PROPOSAL
4 Manufactures/Sources/Quarries : a- Cement b- Aggregates (for each site, if different) c- Reinforcement d- Other 5 National test standards other than those required under (2) and (3) above 6 Testing Laboratory 7 Testing Regimes & Acceptance Criteria for both preliminary and works concrete if different to those required under (1), (2) and (3) above. 8 Characteristic strength of concrete : a- Foundation b- Structures c- Piling (if applicable) 9 Type and characteristic strength of reinforcing steel 10 Mean of protection of concrete from attack by Sulphates, Chlorides, etc. E <u>FOUNDATION PILING</u> * Type of Pile * Probable Length * Nominal Working Load * Cross Section * Proportion of Load supported by shaft friction * Assumed Bearing Stratum * Piling Plant * Drophammer Weights and Drops * Diesel or Air Hammer Blow Energies * Method of Jointing Piles * Mean of Supporting Open Pile Boreholes (i.e. casings or bentonite)	Tenderers to set-out on a separate sheet

SCHEDULE G

SCHEDULE OF TECHNICAL PARTICULARS
MECHANICAL AND ELECTRICAL SERVICES

1- The technical particulars entered in this schedule will be binding upon the contractor and shall not be varied without written instructions from the engineer.

2- The approval or otherwise of these particulars shall in no way be deemed to relieve the contractor of his obligations under this contract.

3- The words ôas specifiedô, ôto suitô, ôequal and approvedô etc., will not be accepted as sufficient description of any item.

4- Tenderers wishing to offer alternative equipment may do so by submitting full technical details as scheduled hereafter on separate sheets.

5- Alternative offers shall also be accompanied by summarized cost adjustments relating to the price entered in the form on Tender. Failure to comply with this requirement may lead to the alternative offer being considered as invalid.

SCHEDULE G

LIGHTING AND SMALL POWER SERVICES

CABLE QX			
* Manufacturer			
* Type			
* Voltage Rating		Volts	
* Quantities included size	1.5 mm2	Metres	
	2.5 mm2	Metres	
	4.0 mm2	Metres	
* Delivery Period			
CONDUIT			
* Manufacturer			
* Type			
* Quantities included size	20 mm	Metres	
	20 mm	Metres	
* Delivery Period			
CONDUIT ACCESSORIES			
* Manufacturer			
* Type			
* Quantities included			
* Delivery Period			

SCHEDULE G

		UNIT
CABLES QXWQX		
* Manufacturer		
* Type		
* Voltage Rating		Volts
* Quantities included size	10 mm2	2 core Metres
	10 mm2	3 core Metres
	10 mm2	4 core Metres
	16 mm2	2 core Metres
	16 mm2	3 core Metres
	16 mm2	4 core Metres
	25 mm2	2 core Metres
	25 mm2	3 core Metres
	25 mm2	4 core Metres
* Delivery Period		
CABLE TERMINATIONõS		
* Manufacturer		
* Type		
* Material		
* Quantities included		
	size _____	No.
	size _____	No.
	size _____	No.
	size _____	No.
	size _____	No.
* Delivery Period		
LIGHTING FITTINGS - FLUORESCENT GENERAL		
* Manufacturer		
* Type and Figure No.		
* Rating		Watts
* Harmonic Content		%
* Delivery Period		

SCHEDULE G

	UNIT	
LIGHTING FITTINGS - ROADWAY		
* Manufacturer		
* Type and Figure No.		
* Light Output Distribution		
* Rating	Watts	
* Harmonic Content		
* Quantities included size		
* Delivery Period		
LIGHTING FITTINGS - TUNGSTEN		
* Manufacturer		
* Type and Figure No.		
* Rating	Watts	
* Quantities Included		
* Delivery Period		
CONTRACTORS		
* Manufacturer		
* Type		
* Rating	VA	
* Number of Contacts		
* Rating of Coil A.C.	Watts	
* Quantities Included		
* Delivery Period		
MINIATURE CIRCUIT BREAKERS		
* Manufacturer		
* Type		
* Rating	Amps	
* Fault Rating	K Amps	
* Quantities Included		
* Delivery Period		

SCHEDULE G

	UNIT	
EARTHING MATERIAL		
* Manufacturer		
* Material and Size		
* Quantities included	Metres	
* Delivery Period		
TIME SWITCHES		
* Manufacturer		
* Type		
* Main Contacts Rating	Amps	
* Rating of Coil	VA Watts Volts	
* Time Span for Reserve Operation No. of ónôóffô facilities		
* Type of motor operation		
* Quantities Included		
* Delivery to Site		

SCHEDULE I

DEPARTURES FROM SPECIFICATION

See Instructions to persons tendering and clause 0.21 of technical specification.

SCHEDULE J

MANUFACTURE, DELIVERY AND COMPLETION DATES

Item 1 (guaranteed dates) of this schedule shall be completed by the tenderer to show the time, calculated from the date of award of contract, in which he guarantees to dispatch to site and to complete erection of the various sections of the works. The times given shall be binding on the Contractor, except in so far as they may be varied by agreement with the Engineer.

The times quoted for the main items of plant and equipment shall apply equally to all associated and ancillary equipment, cables, etc., necessary to completely commission the plant ready for commercial service.

Note: target date of completion for the project shall be nine month after the award of the contract.

SCHEDULE J

MANUFACTURE, DELIVERY AND COMPLETION DATES

1- Guaranteed Dates

Description	Completion of Manufacture	Guaranteed Delivery To Site	Guaranteed Completion Date
• Overall Project • Civil works • Transformers • Cabling			

SCHEDULE K

MANUFACTURERS, PLACES OF MANUFACTURE AND TESTING

The tenderer shall state the town and country where manufacture, testing and inspection are to take place.

Item	Manufacture	Place of Manufacturer	Place of Testing and Inspection
1 Transformers • Power 2 Control & Relay Panels etc. • Control/Relay panels • Relay panels • Relays • Instruments • Lamps • Alarm equipment • Metering equipment 3 Cables • Auxiliary & Control Cables 4 Lighting and small power equipment			

SCHEDULE L

PRICES FOR PLANT AND EQUIPMENT

The prices entered below for the various items, whether or not the items are fully described, shall include everything necessary to leave the equipment complete and in working order at the expiration of the maintenance period in accordance with the provisions of the contract . They shall include the cost of supervisory staff and all other charges. A price must be entered for each individual item; a total price for a number of items is not acceptable. Failure to comply with the foregoing may result in rejection of the tender.

1- DEFINITE WORK ON A LUMP SUM BASIS

Item No. (Schedule .A)	Description	Foreign Currency		Local currency Jordan Dinar
		FOB	I&F	L T. & E
2	Transformersï four unit			
3	Terminations for 33 Kv and 11Kv Transformers cables			
4	Low voltage, Auxiliary power and multi-core control cables including terminations			
Total (to Schedule P)				

SCHEDULE M

PRICES FOR C1VIL ENGINEERING

BUILDING WORKS & SERVICES

The prices to be entered in the following schedule are to the prices for the various items included in the overall turnkey tender price. They are to include for the design, supply and erection/construction of everything necessary, whether fully described or not, to provide the civil engineering and building works and services which are required for the installation, commissioning, operation and maintenance of the mechanical and electrical equipment for the new transformers and associated equipment. The prices are to include all costs of the contractor up to the end of the maintenance period, including supervisory staff and all other overhead charges.

Some items listed may not be required and the Tenderer should enter 'NIL' against these items.

A price must be entered for each individual item; a total price for a number of items is not acceptable. Failure to comply with this requirement may result in rejection of the tender.

Note: Progress payments will be based on interim valuations assessed from the prices in this schedule. For foundations, the prices will be subdivided on the basis of:

Excavation	-	10%
Form work	-	35%
Rebar's	-	30%
Concrete	-	25%

SCHEDULE M

Prices for civil Engineering works and Services

Item No./ Description	Foreign Currency		Jordan Dinars
	FOB	I&F	LT.& E
General and external works 1.1 Site survey 1.2 Subsoil investigation 1.3 Temporary Works 1.4 site clearance and earth works 1.5 foundation for external equipment including transformers with compounds 1.6 Gates and boundary fence 1.7 External lighting 1.8 Design and liaison of civil engineering and building works 1.9 Design and liaison of mechanical and electrical services.			
Total			

SCHEDULE N

QUANTITIES AND PRICES FOR TOOLS AND APPLIANCES

This section is to be completed by the Tenderer. The Tenderer shall furnish a list of tools and appliances in accordance with the requirements of clause 0.5 of the specification (Vo1.II) with itemized prices. The cost of these shall be included in the Schedule of Prices for Definite Works.

		Foreign Currency		Jordan Dinars
NO OFF	Description	F.O.B	I & F	Delivery to IDECO Stores
Total to Next Page				

SCHEDULE N Continuedé ..

QUANTITIES AND PRICES FOR TOOLS AND APPLIANCES

		Foreign Currency		Jordan Dinars
NO OFF	Description	F.O.B	I & F	Delivery to IDECO Stores
Total to SUMMARY (Schedule P)				

SCHEDULE O

QUANITIES AND PRICES FOR SPARES

This Schedule shall be completed by the Tenderer. The Tenderer shall furnish a complete list of spares with breakdown of prices recommended which may or may not in whole or part be purchased by the Employer under the Contract. The cost of these shall be included in the summary of prices for provisional items.

A - PLANT AND EQUIPMENT

REF NO.	Description	Foreign Currency			Jordan Dinars
		NO OFF	F.O.B	I & F	Delivery to IDECO Stores
1	TRANSFORMERS				
2	PROTECTION METERING & CONTROL				
2.1	Relays				
2.2	Meters				
2.3	Fuses / Links				
2.4	Lamps				
2.5	Miscellaneous				
Carried forward					

REF NO.	Description	Foreign Currency			Jordan Dinars
		NO OFF	F.O.B	I & F	Delivery to IDECO Stores
	Brought forward				
3	LIGHTING AND SMALL POWER				
3.1	Distribution boards				
3.2	Lighting Fittings				
	a) Fluorescent General				
	b) Roadway Lantern				
	c) Tungsten / Mercury				
5.A	CABLE (10% Lengths)				
5.B	CABLE JOINTS				
5.C	CABLE SEALING ENDS				
Carried forward					

SCHEDULE P

SUMMARY OF PRICES

Schedule	Item	Foreign Currency		Jordan Dinars
		FOB	I & F	LT & E
	1- DEFINITE WORK ON ALUMP SUM BASIS			
L	Equipment			
M	Civil works			
N	Tools and Appliance			
	2- SUB-TOTAL (DEFINITE WORKS)(L+M+N)			
	3- PROVISIONAL ITEMS			
O-A	Spares ï plant and equipment			
	4- SUB-TOTAL (PROVISIONAL ITEMS)(O-A)			
	5- SUB-TOTAL (DEFINITE WORKS & PROVISIONAL ITEMS) (2 + 4)			
	6- CONTINGENCY SUM, 10% SUB ï TOTAL ABOVE(5)			
	7- TOTAL CONTRACT PRICE (5 + 6)			

SCHEDULE P continuedé é é é

Schedule	Item	Foreign Currency		Jordan Dinars
		FOB	I & F	LT & E
	8- **TOTAL CONTRACT PRICE (from page p-1)**			

TOTAL CONTRACT PRICE _____ **plus JD** _____
(Foreign Currency Total) (Jordan dinar)

The above price shall appear on the from of tender

Tenderers may request payment of the foreign currency portion of the contract price in their own currency or in the currencies of the countries in which principal items of material are to be purchased. If payment is required in more than on foreign currency. Tenderers shall state in the attached table the proportion of the total foreign currency portion which is to be paid in each currency.

FOREIGN CURRENCY OF PAYMENT	PERCENTAGE OF TOTAL FOREIGN CURRENCY %

SCHEDULE S

RATES RELATING TO CIVIL AND BUILDING WORKS

The contractor is reminded that this is a turnkey contract in which he is entirely responsible for every aspect. No additional cost will be considered for any item which the contractor has overlooked. But which is essential for the proper completion of the project in every respect, so that the works fulfill the purpose for which they are required.

If the employer or the engineer requires minor modifications, additions or omissions to the scope of the civil engineering and building works, during the period construction or maintenance, adjustment to the contract price will be made on the basis of the rate entered in the following schedule.

The rates entered shall include all costs and expenses involved in the proper construction of the work, including overheads, profit, supervision, accommodation, insurance's, transport, duties, all risks, liabilities and obligations, etc. but excluding design costs, which are covered by a separate item .

The Tenderer shall price all items

Concrete Strengths

The 28-day characteristic strength of the classes of concrete listed in the schedule of rates may be taken as follows. For pricing purposes:

Grade 25 - 25	N/sq.mm	-	MAX. Aggregate size 20mm
Grade 20 - 20	N/sq.mm	-	MAX. Aggregate size 40mm
Grade 10 - 10	N/sq.mm	-	MAX. Aggregate size 40mm

SCHEDULE S (Continued)

ITEM	DESCRIPTION	UNIT	RATE JD
A	FOUNDATION PILING		
A1	Mobilization and Demobilization	Item	
A2	Form pile of type and capacity stated : Type: ..... Capacity:	Lin m	
B	EXCAVATION		
B1	Excavate to reduce level and remove and deposit where directed include for timbering, denaturing etc., (measured net sizes as drawing).	Cu m	
B2	Evacuate below reduced level not exceeding 1.50m deep to underside of pit, foundation or base and ditto, including for backfilling.	Cu m	
B3	Ditto to underside of trenches and ditto	Cu m	
B4	Ditto exceeding 1.50m not exceeding .00m deep to underside of pit, foundation, base or trench and ditto	Cu m	
B5	Extra over excavation of any type or depth for removal of rock or concrete by use of compressed air or other special equipment.		
B6	Approved hard-core well rammed and consolidated in 150mm layers.	Cu m	
C	CONCRETE WORK UNREINFORCED		
C1	Grade 10 in week fill	Cu m	
C2	Grade 10 in 50mm thick blinding	Cu m	
C3	Grade 20 in foundations and bases	Cu m	
D	REINFORCED CONCRETE		
D1	Grade 25 concrete in foundations, bases, plinths etc. (reinforced measured separately)	Cu m	
D2	Grade 20 concrete as previously described (ditto)	Cu m	
D3	Grade 25 concrete in ground beams (ditto)	Cu m	
D4	Grade 25 concrete in columns (ditto)	Cu m	
D5	Grade 25 concrete in beams (ditto)	Cu m	
D6	Grade 25 concrete in 300mm thick walls (ditto)	sq m	
D7	Grade 25 concrete in 225mm thick walls (ditto)	sq m	
D8	Grade 25 concrete in 150mm thick walls (ditto)	sq m	
D9	Grade 25 concrete in walls (ditto)	Cu m	
D10	Grade 25 concrete in ground slabs 225mm thick finished in a U2 type finish	sq m	

SCHEDULE S (Continued)

ITEM	DESCRIPTION	UNIT	RATE JD
D11	Grade 25 concrete in 150m thick suspended slab finished to a U2 type finish	sq. m	
D12	Extra over all concrete rates for sulphate resisting cement	Cu m	
E	REINFORCEMENT		
E1	16mm diameter and upwards mild steel bar or round reinforcement cut, bent and fixed including all necessary tying wire.	kg	
E2	12mm diameter as previously described	kg	
E3	10mm diameter ditto as previously described	kg	
E4	Fabric reinforcement weighing 4kg per square meter, including fixing	sq. m	
E5	Extra over mild steel rates for high tensile reinforcement (all sizes)	kg	
F	FORMWORK		
F1	Type F1 to sides of foundations, bases, etc.	sq. m	
F2	Type F1 to sides of columns	sq. m	
F3	Type F1 to sides and soffits of beam	sq,. m	
F4	Type F1 to walls	sq. m	
F5	Type F1 to soffits of suspended slabs	sq. m	
F6	Extra over type F1 formwork for type F2 formwork in any position	sq. m	
F7	Ditto for type F3 formwork ditto	sq. m	
G	SUNDRIES		
G1	50mm thick paving slabs laid on and including 50mm thick bed of sand	sq. m	
G2	Duct of cable trench concrete covers 50mm thick, including reinforcement	sq. m	
G3	Damp proof membrane under floor slab	sq. m	
G4	Form pocket in concrete 150mm square x 450mm deep	Number	

SCHEDULE S (Continued)

ITEM	DESCRIPTION	UNIT	RATE JD
H	BLOCKWORK		
H1	100mm thick solid concrete block walling in mortar, as skin of cavity wall, left rough for plaster one side and include for all labors, cutting and waste	sq. m	
H2	150mm thick solid concrete block walling as before described	sq. m	
H3	200mm thick hollow concrete block walling in mortar and left rough for plaster both sides and include for all labor, cutting and waste	sq. m	
H4	150mm thick hollow concrete block walling as before described	sq. m	
H5	Extra over 100, 150 or 200mm block walling as before described for reinforcing every second horizontal bed joint with approved reinforcement	sq. m	
H6	Form 50mm wide cavity between skins of walling including metal wall ties.	sq. m	
J	ROOFING		
J1	Lightweight screed of pumice aggregate or similar, laid to falls with an average thickness of 75mm.	sq. m	
J2	Asphalt covering in two layers total 20mm thickness, laid to falls on sheating felt, including for dressing over edges and round pipes, etc. and for white spar chipping .	sq. m	
K	JOINERY		
K1	50mm plywood faced solid core flush door size 850 x 2000m high, hung complete including door frame, door furniture and decoration.	Number	
K2	Double-leaf doors, as above, but size 1700 wide x 2000mm high, hung complete including door frame, door furniture and decoration	Number	
K3	Adjustable louvered ventilators, at high or low level, fixed complete as specified, including for hardwood and metal farming and glass louvers complete.	sq. m	
L	STRUCTURAL STEELWORKS		
L1	Structural steelworks including corrosion protection, erected and site painted as necessary in stanchions, beams, cladding posts, purlins, crane beams, etc.	Tone	

SCHEDULE S (Continued)

ITEM	DESCRIPTION	UNIT	RATE JD
M	METALWORK		
M1	Supply and fix galvanized mild steel angle kerbing as rebate for trench cover, out of 60mm x 60mm x 6mm angle with mitered corners and with tangs at maximum 900mm centers 20mm x 5mm x 70mm long bent and panged welded to angle. 25mm x 8mm mild steel flat welded to top of angle as trench cover stop. Price to include for grouting kerbing to concrete floor.	Lin m	
M2	Supply 8mm thick galvanized mild steel patterned chequered plate cover to cable trench and include for sizing and fixing	sq. m	
M3	Fixed louvers at high level fixed complete	sq. m	
M4	Supply and fix complete aluminum framed window, with sliding lights, including glass and fittings.	sq. m	
N	BUILDING WORK IN CONNECTION WITH SERVICES AND PLANT INSTALLATION		
N1	Cut or form hole for pipe through 150mm thick concrete block walling and make good plaster both sides	Number	
N2	Cut or form hole for pipe through 200mm thick concrete block wall as before described	Number	
N3	Cut or form hole for pipe through 250mm overall thickness cavity block wall as before described	Number	
N4	Cut or form hole for pipe through 150mm thick reinforced concrete wall	Number	
N5	Cut or form hole for pipe through 150mm thick reinforced concrete slab.	Number	
N6	100mm thick solid concrete block walling in cement mortar in duct walls finished fair face with flush joint one side	sq. m	
N7	Concrete Grade 25 in plinth of base including all necessary formwork	Cu m	
N8	Break-out reinforced concrete not exceeding 300mm thick and remove	sq. m	
N9	Break-out reinforced concrete exceeding 300mm thick and remove	Cu m	
N10	Break-out 200mm thick rendered/plastered hollow concrete block walling and remove	sq. m	
N11	Ditto but 150mm thick solid concrete block walling and remove	sq. m	
N12	Ditto block 250mm overall thickness hollow concrete block work cavity wall ditto	sq. m	

ITEM	DESCRIPTION	UNIT	RATE JD
N13	Cut chase for conduit or pipe in block walling and make good	Lin m	
N14	Cut chase for conduit in concrete and make good	Lin m	
P	PLASTEWORK AND OTHER FLOOR, WALL AND CEILING FINISHES		
P1	Plastework as specified on concrete or block walling inclusive of forming key, narrow widths, small quantities and all labours	sq. m	
P2	Ditto but on ceilings	sq. m	
P3	Tyrolean external render on concrete or block walling as previously described	sq. m	
P4	Glazed ceramic tiles including all cutting, waste, fixing, etc.	sq. m	
P5	Suspended ceiling with and including metal runners and hangers and all narrow widths, labours, plant, etc.	sq. m	
P6	Ditto but with timber or other non-metallic runners and hangers etc.	sq. m	
P7	Terrazzo floor finish as specified	sq. m	
P8	40mm thick oil resistant sand-cement screed finished smooth with hardened surface as specified	sq. m	
P9	Ditto but with acid-resistant finish	sq. m	
P10	PVC tiles laid on screeded floor.	sq. m	
Q	GLAZING		
Q1	4mm clear sheet glass and glazing in various sizes to aluminum frames with approved sealing material	sq. m	
Q2	4mm wired cast glass and ditto	sq. m	
R	PAINT AND DECORATION PREPARING AND APPLYING THE FOLLOWING FINISHED SURFACES ALL AS SPECIFIED AND DESCRIBED		
R1	Emulsion on fair face concrete or block walling	sq. m	
R2	Stone paint on fair face concrete or block walling	sq. m	
R3	Emulsion on plastered walls	sq. m	
R4	Emulsion on Tyrolean rendered walls	sq. m	
R5	Acid-resistant paint on plastered walls	sq. m	
R6	Emulsion on fair-face concrete soffit	sq. m	
R7	Acid-resistant paint on fair-face concrete soffit	sq. m	

SCHEDULE S (Continued)

ITEM	DESCRIPTION	UNIT	RATE JD
S	FENCING, GATES, ROADS AND PATHS		
S1	Galvanized chain link fence, 2.4 meters high, including concrete posts with cranked tops for and including barbed wire, fixed complete as specified, including excavation and backfield, concrete foundations, concrete kerb, etc.	Lin m	
S2	Double leaf gate 4 meters wide, to match fence, all as specified, including gate posts.	Number	
S3	Tarmacadam surface road constructed complete, including excavation or fill, compacted stone base, precast concrete kerbs on concrete haunching, etc.	sq. m	
S4	Tarmacatam surfaced path constructed complete, including excavation or fill, compacted stone base, complete edge kerbs etc.	sq. m	
T	DRAINAGE AND CABLE DUCTS		
T1	100mm uPVC pipe laid and jointed complete, average depth to invert 1 meter, including excavation back filling and reinstatement	Lin m	
T2	150mm ditto and ditto	Lin m	
T3	Ditto but average depth to invert 2 meters and ditto	Lin m	
T4	100mm asbestos-cement pipe laid and jointed complete, average depth to invert 1 meter, including excavation and reinstatement.	Lin m	
T5	150mm ditto and ditto	Lin m	
T6	Ditto but average depth to invert 2 meters and ditto		
T7	Manhole constructed complete, including excavation, rendered concrete block walls, benching, cover and frame, internal size 1.3 x 1.0 meter, depth on invert not exceeding 2 meters		
T8	Ditto but inspection chamber, internal size 600 x 500mm not exceeding 500mm to invert.	Number	
T9	Catchpit constructed complete, including excavation, concrete block walls, cover and frame, internal size 1.3 x 1.0 meter, depth to invert not exceeding 2 meters	Number	
T10	Ditto but internal size 600 x 500m depth to invert not exceeding 500mm	Number	
T11	Surface water or septic tank effluent soakaway complete, including excavation, concrete block walls cover and frame, internal size 2 meters diameter, depth not exceeding 3 meters .	Number	

ITEM	DESCRIPTION	UNIT	RATE JD
T12	100mm dial. uPVC cable duct laid and jointed on and surrounded with sand, depth to invert not exceeding 500mm including for excavation and backfilling	Lin m	
T13	Ditto but surrounded with 150mm minimum Grade 10 concrete surround under roads, depth to invert not exceeding 700mm including for excavation and backfilling	Lin m	
U	WATER MAINS		
U1	75mm diameter uPVC pressure pipe laid complete on and surrounded and sand, depth not exceeding 1 meter	Lin m	
U2	75mm diameter sluice valve laid and jointed complete with hatch box and cover	Number	
U3	75mm diameter air valve ditto	Number	
U4	50mm diameter polythene pressure pipe laid complete on and surrounded with sand, depth not exceeding 1 meter.	Lin m	
V	DESIGN WORK		
V1	Percentage to be added to cost of construction, for design and detailing of any part of the works, including architectural, structural, civil, mechanical and electrical services	%	
W	STONE WORK Eshtafeena stone		

SCHEDULE T

RATES AND CONDITIONS FOR WORK CARRIED OUT ON TIME AND MATERIAL BASIS

These rates shall apply to any additional minor work within the scope of the contract that the engineer may require the contractor to carry out on a time and material basis. The rates shall be deemed to include all local and head office charges, including supervision.

Payment shall be made only for additional work authorized in writing by the engineer and on receipt of a detailed statement of the services supplied, endorsed by the engineer and contractorôs representatives .

All claims in respect of extra to contract work shall be submitted to the engineer for approval within one month of the work being completed to the satisfaction of the engineer.

Local labour	- net cost of rates agreed with the engineer at site plus	_____ %
Transport	- net cost plus	_____ %
Other services	- net cost plus	_____ %
Materials	- net cost at site plus	_____ %

Expatriate Staff Rates

The following rates shall apply where the agreement with the Engineer expatriate staff are employed on time and material work in a direct capacity i.e. other than in a supervisory capacity or where by the nature and location of the extra work, supervision additional to that required by the contract works become necessary . Payment will be subject to the conditions set out above.

The rates may also be employed as a basis for assessing any legitimate claims for additional costs in accordance with the conditions of contract where these have not already been claimed in accordance with the previous paragraph.

Engineer	per working day JD	_____
Foreman	per working day JD	_____
Charge hand	per working day JD	_____

SCHEDULE U

PROPOSED SITE ORGANIZATION

(Details to be entered below, including qualification of staff)

SCHEDULE V
PROGRESS CHART FORMAT

CONTRACT PROGRESS BAR CHART (TYPICAL) - - - see clause 0.24

DESIGN / MANUFACTURE TRANSPORT SITE ERECTION COMMISSIONING

	2015 2016	% COMPLETION	
	3 4 5 6 7 8 9 10 11	PLANNED	ACTUAL
ELECTRICAL PLANT (overall)	Design / manufacture Transport Site erection commissioning		
CIVIL WORKS (overall)	Design / manufacture Transport Site erection		

PLANNED ACTUAL

SCHEDULE W

Tendererôs experience

(Details to be entered below, please refer to instruction to persons tendering clause 4 for details.)