

JABATAN KERJA RAYA MALAYSIA

**PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE
KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB**

SENARAI KUANTITI

Kami seperti nama syarikat di bawah mengesahkan tawaran harga yang tersenarai di dalam senarai kuantiti ini adalah sama sepertimana di dalam Borang Tender yang dihasilkan di dalam sistem dan sebarang percanggahan akan menyebabkan tawaran kami ditolak.

- A. Nama Syarikat: **Nama Petender**
- B. CIDB/UPKJ/PUKONSA No.: **No.Pendaftaran Petender**
- C. Harga Tawaran: **Harga Tawaran Petender**
- D. No. Siri Tender: **JKR/CKE/22191/2024**
- E. Tarikh Cipta Senarai Kuantiti: **11/19/2024**

Senarai kuantiti ini dikeluarkan oleh JKR. Sebarang pertanyaan boleh berhubung dengan pegawai yang menyediakan tender dan maklumat pegawai untuk dihubungi boleh didapati di laman iklan.

JABATAN KERJA RAYA MALAYSIA

PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB

SENARAI KUANTITI

No. Tender: JKR/CKE/22191/2024

RINGKASAN TENDER

PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI,
KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB

ITEM	DESCRIPTION	PAGE NO.	AMOUNT(RM)
	Sila pilih disini atau delete sekiranya tidak perlu	Sila pilih muka surat	
A	PRELIMINARIES	A/10/10	
B	LED ROAD LIGHTING	B/7/7	
C	INTEGRATED SOLAR LED ROAD LIGHTING	C/4/4	
D	VEHICULAR ARCH CULVERT (VAC) SOLAR LED	D/3/3	
E	MISCELLANEOUS	E/4/4	
Jumlah di bawa ke Borang Tender			-

A PRELIMINARIES

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
A		<p>PART I - GENERAL INFORMATION</p> <p>Notes:</p> <p>The amounts inserted by the Nominated Sub-Contractor for such Preliminary Items shall be deemed to apply to the whole of the Works carried out under this Sub-Contract.</p> <p>Each Preliminary Item or Clause shall be individually priced. Bulk pricing for sections, trades, groups or pages of Preliminary Items or Clauses shall not be accepted and no subsequent claims for loss or expenses and/or profit shall be entertained for failure to comply with this clause.</p> <p>Where any Preliminary Item or Clause is left unpriced, it shall be deemed that the cost of such Preliminary Items or Clauses have been allowed for elsewhere within these Sub-Contract Document. No subsequent claims arising out of expenses and/or loss incurred against such unprices Preliminary Item or Clauses shall be entertained.</p> <p>Notwithstanding the above clauses, the S.O. reserves the right to request from the Contractor the detailed breakdown of the pricing for Preliminary Items or Clauses or the rates in the Bill of Quantities for examination and approval. The approved detailed breakdown pricing shall then be used as a basis for the administration of the Sub-Contract.</p> <p>Headings are not comprehensive and do not necessarily reflect or modify the meaning of the items in the B.Q. The exact nature and extent of the work to be carried out shall be ascertained by reference to the Contract as a whole, in particular the Conditions of Contract, the Specification and the Drawings.</p> <p>Where Preliminary Items or Clauses or items in the Bill of Quantities are priced but have not been executed on site by the Contractor, the cost of such priced items or clauses or items in the Bill of Quantities shall accordingly be deducted from the Contract Sum when so instructed by the S.O.</p>				
1.0		<p><u>Pricing of Bill of Quantities</u></p>				
1.1		<p>The sum of the amounts of all items of the Bill of Quantities priced by the tenderer shall truly represent the amount shown in his tender. The rates set down by the Tenderer against each item in the Bill of Quantities shall be the full inclusive rates and prices for the finished work (unless expressly provided to the contrary) and shall be held to include providing and delivering all materials, unloading, cutting and waste on materials, storage, packing, carriage and cartage, hoisting, all labour, setting, fitting and fixing in position, use of plant, providing suspension, establishment charges, profit and all other labour and everything else necessary for the due and proper completion of each item.</p>				
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A PRELIMINARIES

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
		<u>Pricing of Bill of Quantities (cont'd)</u>				
1.2		Where the tenderer leaves any item blank in the preliminaries or insert only a dash against any item in these Bill of Quantities the value thereof shall be deemed to be included in the prices or rates of other items therein.				
1.3		No unauthorised alteration, addition or note entered in these Bill of Quantities shall modify the printed text.				
1.4		Headings and notes appearing shall not by itself be deemed to be comprehensive and do not modify the meaning of the items in the Bill of Quantities.				
1.5		Any rates found to be overpriced, inconsistently priced, underpriced or erroneously priced shall be subjected to adjustment, rectification and rationalisation before the signing of the contract and the authority to fix a reasonable rates/amount shall be with the S.O. The amended rates shall be used for computing the progress payments and the measuring of variations.				
1.6		Where Quantities in these Bill of Quantities are marked provisional, the works shall be remeasured on completion basing on drawings certified as true and correct representation of the completed works by the Superintending				
1.7		There shall be no alteration or amendment, specifying or submission of condition in contravention to those contained in Bills of Quantities. If such conditions are included, the tender submitted may not be considered and liable to be disqualified.				
2.0		<u>Currency of Payment</u>				
2.1		Pricing of the Sub-Contract shall be in Malaysian Ringgit to two decimal place. Payment to the Nominated Sub-Contractor under the Sub-Contract shall be in Malaysian Ringgit.				
3		<u>Form of Sub-Contract</u>				
3.1		The Articles of Agreement and Conditions of Sub-Contract will be those contained in the Standard Form of Sub-Contract-PWD Form 203N Rev.1/2010 and Instruction Notes To Tenderers (INTT). A copy of the said Form and Additional General Condition which form part of the Tender Table Documents is available for inspection during normal office hours on any working day up to the time appointed for				
4		<u>Compliance with Safety Requirement and Regulations</u>				
4.1		The Nominated Sub-Contractor shall always adhere to all requirement and regulations under Occupational Safety and Health Act and maintain a safe and healthy working environment through out the execution of Sub-Contract Works.				
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A PRELIMINARIES

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
5.0		<u>Making Good Defects During Defects Liability Period (DLP)</u>				
5.1		The Nominated Sub-Contractor shall make good of any defects, shrinkage and any other faults which may appear within the Defects Liability Period as provided in the Sub-Contract, commencing from Practical Completion of the Sub-Contract Works as certified by the S.O.				
5.2		No claim shall be entertained if the repair of any defects results an increment in cost.				
6.0		<u>Duty Stamping</u>				
6.1		The Nominated Sub-Contractor shall solely bear the cost for stamp duties and anything incidental thereto.				
B		PART II - PRICING OF PRELIMINARIES ITEMS				
1		<u>Material and Workmanship</u>				
1.1		The description of materials and workmanship in these Bill of Quantities and/or Drawings are to be read in conjunction with the relevant Specifications contained in the Sub-Contract. Materials and equipment supplied and installed shall comply with the condition set down in the Instruction Notes To Tenderers (INTT). Allow for submission of samples of materials and workmanship as the S.O.'s Representative may require for this approval before the materials are supplied and installed or workmanship are embodied in the finished works. All samples which are approved shall be retained on the Site and shall represent or indicate the standard to be maintained in the execution of the Sub-Contract Works. All samples shall be cleared away when no longer so required for the purpose.	LS	LS		
2		<u>Application To and Testing By The Authorities</u> Allow for submission of applications, inspections, tests and approvals including the registration of the installation and endorsement of documents by professional/competant person in compliance to the requirements of the relevant Authorities having jurisdiction over the Sub-Contract Work. All cost and fees incurred in the process of gettings the Sub-Contract Works inspected, tested and approved by the relevant Authorities shall be included in the Sub-Contract Sum. No additional costs will be entertained in this respect.	LS	LS		

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A PRELIMINARIES

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
3		<p>It shall include the following but not limited to:-</p> <p>a) Earth Resistance test results shall be verified by a Service Engineer (The Earth Resistance Tester shall be calibrated every 2 years).</p> <p>b) Test methods must comply with IEEE Std 81- Guide For Measuring Earth Resistivity, Ground Impedance and Earth Surface Potentials of a Grounding System.</p> <p><u>Inspection, Testing and Commissioning</u></p>				
3.1		<p>Allow here or in the rates for the cost of carrying out inspection and tests at works, testing and commissioning of the installation and the equipment of the Sub-Contract Works as required in the relevant Specifications including providing all necessary labour, materials, transportation, appliances or equipment, electricity and fuels, and paying all fees and charges for tests carried out by others</p>	LS	LS		
4		<p><u>Clause 24 - Insurance Against Personal Injuries and Property</u></p>				
4.1		<p>The Nominated Sub-Contractor shall be liable and shall indemnify both the Main Contractor and the Government against any expenses, damage, liability, loss, claim, or proceedings whatsoever arising from any common law or statute in the course of the execution of the Sub-Contract Works as per described under Clause 24.</p>	LS	LS		
5		<p><u>Clause 26 - Employee's Social Security Act 1969</u></p>				
5.1		<p>The Nominated Sub-Contractor shall cause to register all local workmen under his employment under Employee's Social Security Scheme (SOC SO) in accordance with the Employment's Social Security Act 1969 or any subsequent modification and re-enactment of the said Act. The Nominated Sub-Contractor shall submit Code Number and Social Security Numbers of all workmen under the SOC SO scheme to the S.O for verification.</p> <p>The Nominated Sub-Contractor shall make payment of all contributions from time to time on the first day on which the same ought to be paid and until the completion of the Sub-Contract Works, and upon demand the Nominated Sub-Contractor shall produce to the S.O.'s Representative contribution cards or stamp vouchers as evidence of payment of such contribution.</p>	LS	LS		

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Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
6		<u>Clause 27 - Insurance of Sub-Contract Work</u>				
6.1		The Nominated Sub-Contractor shall insure for the full value amount of the Sub-Contract Works (including materials and goods of the Nominated Sub-Contractor properly delivered on the Site for use in the Sub-Contract Works) and keep or have them kept insured against loss or damage by fire, lightning, explosion, storm, tempest, flood, ground subsidence, bursting or overflowing of water tanks, apparatus or pipes, aircraft and other aerial devices or articles dropped therefrom, riot and civil commotion as per described in Clause 26. All excesses, if any, imposed by the Insurance Company shall be borne by the Nominated Sub-Contractor.	LS	LS		
7		<u>Clause 28 - Performance Bond</u>				
7.1		The Nominated Sub-Contractor shall, as a condition precedent to the commencement of any work under this Sub-Contract, deposit with the Contractor a performance bond in the form of a Banker's Draft or an approved Banker's or Insurance Guarantee equivalent to five (5 %) percent of the Sub-Contract Sum to secure the due performance of the obligations under this Sub-Contract by the Nominated Sub-	LS	LS		
8		<u>Protection of Existing Services</u>				
8.1		Protect, uphold and maintain all existing and in use pipes, ducts, sewers, services mains, underground cables, etc. During the execution of the Sub-Contract Works, unless otherwise directed. If the Nominated Sub-Contractor discovers any underground cables, pipes, etc, he shall immediately stop work and report to the S.O's Representative of the findings. The Nominated Sub-Contractor shall be responsible for making good all damages to the cable, pipes, etc. and shall indemnify the Government against any claims as a result of such damage. Notes: Applicable for upgrading and renovation projects	LS	LS		
9		<u>Sub-Contract Work Programme</u>				
9.1		Provide for implementing the Critical Path Method programme in conjunction with Main Contract Works for planning, monitoring, control of resources and progress of work shall include : Planning, preparing, maintaining and updating the CPM programme preferably using latest version of Microsoft Project. The identification of critical path for the timely execution of the work to completion.	LS	LS		

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Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
10		<p><u>Competent Persons</u></p> <p>The Nominated Sub-Contractor shall appoint a Competent Person or Competent Persons in compliance with the Electricity Regulations 1994 to provide necessary superintendence over the whole site operation for the full duration of the Sub-Contract Works and as long thereafter as the S.O.'s Representative may consider necessary for the proper fulfillment the Nominated Sub-Contractor's obligation</p> <p>The qualification of the Competent Persons shall be in compliance with the Electricity Regulations 1994 and approved by the S.O.'s Representative, and he shall be constantly on the Site and shall devote his whole time to the superintendence of the Sub-Contract Works. He shall take responsibility for the construction, installation testing, commissioning and operation of the whole Sub-Contract Works in compliance with the Electricity Regulations 1994 and any other laws having jurisdiction over the Sub-Contract Works</p> <p>The S.O.'s Representative will be at liberty to object to and requires the Nominated Sub-Contractor to remove forthwith from the Site such Competent Person, who in the opinion of the S.O.'s Representative, misconducts himself or is incompetent or negligent in the proper considered by the S.O.'s Representative to be undesirable. The Nominated Sub-Contractor shall, upon the removal of such person, thereafter replaced as soon as possible a new Competent Person in compliance with the requirement of this section.</p>				
11		<p><u>Resources For Site Safety</u></p>				
11.1		<p>The Nominated Sub-Contractor shall provide and maintain all Personal Protective Equipment required for the use of the S.O.'s Representative and his supervisory staff and any other officials complete as specified and complying with DOSH requirements. All items must obtain approval from the S.O.'s Representative. The items are as follows:</p> <p>a) Safety Helmet (white colour c/w JKR's Logo)</p> <p>b) Reflective Safety Vest/Protection Clothing (c/w JKR's Logo)</p> <p>c) Safety Boots</p> <p>d) Safety Cones</p> <p>e) Warning Lights*</p> <p>*Electrical work for road construction only</p>	<p>nos</p> <p>nos</p> <p>nos</p> <p>nos</p> <p>nos</p>	<p>10</p> <p>10</p> <p>10</p> <p>10</p> <p>10</p>		
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Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
12		<u>Progress Reports and Photographs</u>				
12.1		Allow for providing monthly reports including photographs showing the progress of the Sub-Contract Works in digital format, each of different view of the Sub-Contract Works as directed by the S.O.'s Representative. A total of three (3) sets of reports properly binded and the digital format shall be provided to the S.O.'s Representative (2 sets) and HODT office (1 set).	LS	LS		
13		<u>Shop / Working Drawings</u>				
13.1		Provide for the preparation, submission and thereafter the approval for construction from the S.O.'s Representative all shop / working drawings for the Sub-Contract Works as required in the relevant Specifications in the Sub-Contract. The contractor will be provided with project site plan and electrical layout drawings in digital format by JKR for shop/working drawing preparation. Detail final sub-circuits and switching arrangement, shall be prepared, calculated and approved before installation. Final sub-circuits shall include lighting and power installation. For the project using Building Information Modelling (BIM), all drawings shall be in 3D model using Autodesk REVIT software which includes preparation of all related electrical system complete with conduit and trunking, all components, system modeling and integration with all related building model not limited to Architectural, Structural and Mechanical model and other services. The integrated 3D model shall be used to generate working drawings as specified in the Sub-	LS	LS		

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Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
14		<u>Electrical Protection Schemes (Calibrations)</u>				
14.1		Allow for fees and charges for the employment of an Electrical Services Contractor registered under Electricity Regulations 1994 to study and submit proposal (with relevant data and calculations) for the electrical protection scheme for the whole electrical installation in the Sub-Contract works. Thereafter, if the proposal is agreeable by the S.O.'s Representative, he shall check, test and calibrate accordingly all protective relays and device provided in the Sub-Contract Works to the requirements of the Electricity Regulations 1994. He shall also prepare, duly sign and submit all certification as required under Electricity Regulations 1994.	LS	LS		
15		<u>Clearing and Cleaning of Site</u>				
15.1		The Nominated Sub-Contractor shall, upon completion of the work, remove away immediately from site all plants and surplus materials except those ordered to be left on the site, together with all rubbish and debris. The site is to be restored in a neat, clean and workmanlike manner to the satisfaction of	LS	LS		
16		<u>Documentation Upon Completion</u>				
16.1		Upon completion of the work and before handing over, the Nominated Sub-Contractor shall submit documents as follow: a) Four (4) sets contained the following documents, properly titled and binded in hard covers :- i - Installation Manuals, Operation Manuals, Service and Maintenance Manuals, and Part Lists for all equipment supplied and installed in the Sub-Contract; ii - All Product Data and Catalogue of equipment supplied and installed in the Sub-Contract; iii - All Supervision and Completion Certificate, and Test Certificate in compliance with the Electricity Regulations iv - All other Test Certificates; v - As-built drawings as required in the relevant vi - All Certificate of Warranties and Guarantees copies issued by the original equipment manufacturers. b) Four (4) copy of CD-RW containing all as-built drawings in Autocad and/or BIM 3D model format. c) All original Certificate of Warranties and Guarantees issued by the original equipment manufacturers.	LS	LS		

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Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
17		d) One (1) copy of List of username and password (administrator) for logging in of ELV and ICT systems / equipments (if applicable) e) One (1) set maintenance tools as prescribed in the relevant Specifications. <u>Equipment Inventory List</u>				
17.1		Allow for preparation inventory list for equipment installed as per in the Sub-Contract. The inventory list shall include and not limit to all data and particulars of the equipment and accessories pertaining to their types, models, descriptions and quantities. The format shall be in MS Excel of latest version as per Appendix A of Preliminaries. Two (2) sets of softcopy in CD-RW and four (4) sets of hardcopy in comb binded shall be submitted to S.O.'s Representative.	LS	LS		
18		<u>Sub-Contract Document</u>				
18.1		Allow for the cost for twelve (12) copies of contract document binding. The document format shall follow as per JKR	LS	LS		
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A PRELIMINARIES

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
		<u>COLLECTION</u>				
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B LED ROAD LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
1		GENERAL NOTES: Final quantities shall be measured upon completion and price will be adjusted accordingly. Supply, install commissioning and ready to operate for Road Lighting System (LED). Refer to List of Drawing. Rates shall include for all operations necessary for the design, manufacture, testing, supply, delivery and installation of all item etc as per drawing. Installation of electrical equipment shall be as per JKR Material Approval List - JMAL Manufacturer's catalogue, technical specifications and data for all offered equipment shall submitted together with the tender for evaluation.Tender with incomplete catalogue and specifications will be rejected.				
		METER PANEL AND ACCESSORIES To supply, deliver and ready to operate the following as per JKR specification: Rates shall include for all operation necessary for the design, manufacture, testing, supply, delivery and installation of Meter Panel etc as per Drawing and standard drawing TNB.				
		1.1 Supply, deliver, install, test and commission of outdoor weatherproof (IP54) Electro galvanised Sheet Steel Meter Panel complete with 1 Meter compartments,1 individual openings for meter viewing, metal plate board, busbar, external padlocking facilities with anti-chemical padlocks and related accessories as per TNB requirement.				
		1.2 Concrete plinth at 2.0 meter height for TNB Meter Panel Kiosk (No Drawing: Refer new standard drawing TNB)				
1.3		Meter Panel labelling (PVC plate) as per drawing (the actual wording shall be confirmed with the TNB).	lot	1		

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B LED ROAD LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
2		FEEDER PILLAR AND ACCESSORIES To supply, deliver and ready to operate the following:				
2.1		Supply, deliver, install, test and commission of outdoor weatherproof (IP54) Stainless Steel Type (SS316) Feeder Pillar anti-sticker paint coating (Epoxy Coated With Oven Baked / OR suitable for stainless steel SS316) (25kA@400V at 1sec), 2mm thickness feeder pillar complete with 100A/60A MCCB 4P, MCB, RCCB, ELR, contactors, 3 x Ammeter c/w max demand indicator, voltmeter, selector switch for voltmeter, 24 hours time switch (battery operated), photo cell, 2 nos 1 x (8.5W-11W) T8 LED fitting, bypass switch, Security Barrel Locking System device with anti-chemical, 13A S/S/O, heater, indicator light (LED type), extended busbar c/w bi metal lug (if required), maintenance log book, laminated schematic and other related accessories as per drawings, specifications, JKR Approved requirement. Heat shrinkable/Cable gland must be used for incoming cable termination and cable gland must be used for outgoing cable (Note: All extended busbar and accessories shall be used same brand as MCCB. a) Main Feeder Pillar MFP-LR. b) Feeder Pillar FP/LR-1. c) Feeder Pillar FP/LR-2	lot	1		
2.2		Concrete plinth at 2.0 meter height from ground level for feeder pillar c/w paved platform for maintenance, sand, labelling identification etc as per drawings.	lot	3		
2.3		Solid Earthing System using 2nos of 25mm x 3mm copper tape, 16mm dia. X 2nos. of 1500mm(L) copper jacketed steel core earth electrode and precast heavy duty concrete earth chamber c/w removable cover (to be repeated if necessary to achieve $\leq 3\text{ohm}$). Note: Connection of copper tape to earth electrode shall be by exothermic welding connection.	lot	3		
2.4		Feeder Pillar labelling (painted directly on the feeder pillar's body) suitable for anti sticker paint used as per drawing (the actual wording shall be confirmed with the S.O's Representative)	lot	3		
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B LED ROAD LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
3		LIGHTING COLUMN AND ACCESSORIES Note: Rates shall include for all operations necessary for the design, manufacture, testing, supply, delivery and installation of the lighting column etc as per drawing.				
3.1		12.0 meter height , flange type hot dipped galvanised octagonal steel column c/w double spigot , two fibre service door double slot hinge with door stiffener and anti vandalism locking device, internal wiring using 2.5mm ² PVC/PVC cable, other accessories as per specification and drawings the word 'JKR' shall be embossed on the service door.	nos	32		
3.2		11.0 meter height (on bridge corbell) , flange type hot dipped galvanised octagonal steel column c/w double spigot , two fibre service door double slot hinge with door stiffener and anti vandalism locking device, internal wiring using 2.5mm ² PVC/PVC cable, other accessories as per specification and drawings the word 'JKR' shall be embossed	nos	4		
3.3		12.0 meter height , flanged type hot dipped galvanised octagonal steel column c/w single spigot , 2 nos fiberglass type service door, double slot hinge with door stiffener, internal wiring using 2.5 mm ² PVC/PVC cable, other accessories as per specifications and drawings. The word "JKR" shall be embossed on the service door.	nos	73		
3.4		Surge Protection Device for column c/w internal wiring using 2.5mm ² PVC/PVC cable, other accessories as per specification and drawings (as detail below) a) (L-N), nominal discharge current (In) 20kA, 8/20microsec, max discharge current (Imax) 40kA 8/20, microsec, voltage protection level (Up) 1500V@20kA. b) (N-E) nominal discharge current (In)20kA, 8/20microsec, max discharge current (Imax) 40kA, 8/20 voltage protection level (Up) 1500V @20kA	lot	109		
3.5		Earthing system (for SPD Earth) c/w 1x16mm PVC copper cable, 1500mm length copper rod, exothermic welding and other accessories as per drawing and specification for every lighting column.	lot	109		
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B LED ROAD LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
3.6		To supply and install concrete footing suitable to mount 12.0 meter height lighting column as per approval from C&S Consultant. The contractor shall confirm the size of concrete footing with the road lighting column manufacturer to suit the soil condition.	nos	105		
3.7		To supply and install concrete footing suitable to mount 11.0 meter height lighting column as per approval from C&S Consultant. The contractor shall confirm the size of concrete footing with the road lighting column manufacturer to suit the soil condition.	nos	4		
3.8		Modular Termination Box c/w 15A cut-out fuse assembled in solid panel, suitable for terminations up to 4 core 25 sq.mm PVC/SWA/PVC (Al) cable. The modular termination box shall be manufactured to IP54 with double layer transparent panel/cover.	nos	109		
3.9		Column reflective labelling as per drawing. For pole at median, two label are required to be adhered each side of pole. (The actual wording shall be confirmed with the S.O's	nos	109		
4		<p><u>LUMINAIRE AND ACCESSORIES</u></p> <p>To supply, deliver, install and test the following:</p> <p>a) Rate shall include for the supply, deliver, installation, testing and commissioning</p> <p>b) Catalogue showing isolux diagram, utilization factor curves, polar curves of C-Planes 0/180, 90/270, maximum intensity planes, downward light output ratio, downward and upward flux fractions and computer generated print-outs showing all the calculation results of the light distribution on the road surface using the luminaire offered shall be enclosed together.</p> <p>c) Index Protection of LED luminaires shall be minimum IP65</p> <p>d) Access to the electronic control gear(driver) compartment shall preferably be from the top.</p> <p>e) Main supporting structure made of die-cast aluminium alloy material. GRP/FRP material is not acceptable.</p> <p>f) Appendix A to G of LS20 shall be filled and duly signed.</p> <p>g) Registered in JMAL (http://jmal.jkr.gov.my/emapv3), Cawangan Kejuruteraan Elektrik Ibu Pejabat JKR and complying to JKR standards specifications (L-S20).</p> <p>h) Minimum requirement : 2.0 cd/m2</p>				
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB					To Collection Page	

B LED ROAD LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
4.1		<p>i) LED road lighting luminaire supplied shall complete with 5 years warranty by manufacturer/distributor.</p> <p>High Quality ≤ 180Watt LED Luminaire c/w electronic controlgear (driver), built in SPD, thermal management unit and design for both side entry and post top mounting suitable for supply voltage of 230V, 50Hz (on a suitable module unit and shall be easily removable and replaceable as a unit without the use of any special tools) c/w Nema Socket Ready for Smart 7 pin and other accessories as per specification and drawings.Refer JKR standards specifications (L-S20) for SPD requirement.</p>	nos	145		
4.2		<p>High Quality ≤ 100Watt LED floodlight Luminaire for underbridge lighting (minimum requirement of 50 lux) c/w electronic controlgear (driver), built in SPD, 20A DP isolator, thermal management unit and design for both side entry and post top mounting suitable for supply voltage of 230V, 50Hz (on a suitable module unit and shall be easily removable and replaceable as a unit without the use of any special tools) and other accessories as per specification and drawings. Refer JKR standards specifications(L-S20) for SPD requirement.</p> <p>Note : Simulation report shall be submitted. Luminaire efficacy shall be rated ≥100 lumen/watt.</p>	nos	12		
5		<p><u>CABLE AND ACCESSORIES</u></p> <p>To supply, deliver, install and test the following:</p> <p>Note: Rates shall include for the supply and pulling of cables including trenching, sand bedding, jointing of cables (bi-metal lug), terminations, backfilling, compaction, bricks/ PVC slab, multi strand nylon rope, disposal of surplus material and making good of site surface as to complete the installation in accordance with specification, L-S3 guidelines and to the satisfaction of the S.O representative.</p>				
5.1		Cable 4C 25 sq.mm PVC/SWA/PVC (AL) Underground cable for LED street lighting and underbridge fittings.	mtr	6,600		
5.2		Cable 4C 70 sq.mm PVC/SWA/PVC (AL) Underground cable for Feeder Pillar FP/LR-1 and FP/LR-3.	mtr	300		
5.3		Cable 4C 95 sq.mm PVC/SWA/PVC (AL) Underground cable for Feeder Pillar FP/LR-2.	mtr	600		
5.4		Cable marker from feeder pillars to first column.	nos	40		
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB					To Collection Page	

B LED ROAD LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
6		<u>UNDERGROUND DUCTS AND ACCESSORIES</u> To supply, deliver, install and test the following: Rate shall include for the supply and laying of underground ducts including trenching, jointing (using proper collars), backfilling, draw wire, compaction, crossing markers, disposal of surplus material, making good of site surface as per drawings and specifications and to satisfaction of S.O Representative. a) 150mm dia. HDPE PN10 Pipe (road crossing and laid in median) b) 50mm dia. G.I Pipe Class B (Elevated structure and Surface installation) c) 100mm dia. uPVC pipe for street lighting cable concealed at median NJB, etc.	mtr mtr mtr	250 100 1,100		
7		<u>CABLE PIT</u> To supply and install Cable Pit size : 460mm (L) x 460mm (W) x 760mm (D) c/w removeable heavy duty cover as per drawing and specifications.	lot	5		
8		<u>PARAPET SERVICE DOOR</u> To supply and install fibre service door for parapet c/w rivet points.	nos	53		
9		<u>NJB COVER</u> Supply and install 3mm thick galvanised cover plates for lighting pole at NJB complete with M10 bolts and 75mm long embedded split sleeve as shown in Detailed Drawing.	nos	106		
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB						
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B LED ROAD LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
		<u>COLLECTION</u>				
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		Page B/2/7				
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		Page B/4/7				
		Page B/5/7				
		Page B/6/7				
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB					To "Ringkasan Tender"	

C INTEGRATED SOLAR LED ROAD LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
1		GENERAL NOTES: Final quantities shall be measured upon completion and price will be adjusted accordingly. Supply, install, commissioning and ready to operate for stand alone Integrated Solar LED Road Lighting. Refer to List of Drawing. To supply and install mock up Sample for Solar LED Road Lighting at location subject to S.O's Representative. Rates shall include for all operations necessary for the design, manufacture, testing, supply, delivery and installation of all item etc as per drawing. Manufacturer's catalogue, technical specifications and data for all offered equipment shall submitted together with the tender for evaluation.Tender with incomplete catalogue and specifications will be rejected. <u>LIGHTING COLUMN AND ACCESSORIES</u>				
1.1		10.0 meter height, single spigot , flange type Hot Dipped Galvanised octagonal steel column for Integrated Solar LED Road Lighting and other accessories required as per specification and drawing. The word "JKR" shall be embossed on the service door. The column strength shall be able to withstand the Integrated Solar LED luminaire's weight to manufacturer's recommendation & specification.	nos	46		
1.2		9.0 meter height on Bridge Corbel, single spigot , flange type Hot Dipped Galvanised octagonal steel column for Integrated Solar LED Road Lighting and other accessories required as per specification and drawing. The word "JKR" shall be embossed on the service door. The column strength shall be able to withstand the Integrated Solar LED luminaire's weight to manufacturer's recommendation & specification.	nos	10		
1.3		12.0 meter height, single spigot , flange type Hot Dipped Galvanised octagonal steel column for Integrated Solar LED Road Lighting and other accessories required as per specification and drawing. The word "JKR" shall be embossed on the service door. The column strength shall be able to withstand the Integrated Solar LED luminaire's weight to manufacturer's recommendation & specification.	nos	6		
1.4		11.0 meter height on Bridge Corbel, double spigot , flange type Hot Dipped Galvanised octagonal steel column for Integrated Solar LED Road Lighting and other accessories required as per specification and drawing. The word "JKR" shall be embossed on the service door. The column strength shall be able to withstand the Integrated Solar LED luminaire's weight to manufacturer's recommendation & specification.	nos	5		
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB					To Collection Page	

C INTEGRATED SOLAR LED ROAD LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
1.5		12.0 meter height, double spigot , flange type Hot Dipped Galvanised octagonal steel column for Integrated Solar LED Road Lighting and other accessories required as per specification and drawing. The word "JKR" shall be embossed on the service door. The column strength shall be able to withstand the Integrated Solar LED luminaire's weight to manufacturer's recommendation & specification.	nos	11		
1.6		To supply and install concrete footing suitable to mount 10.0 / 12.0 meter height lighting column for Integrated type Solar LED Road Lighting as per approval from C&S Consultant . The contractor shall confirm the size of concrete footing with the road lighting column manufacturer to suit the soil condition and column height & weight.	nos	63		
1.7		Column reflective labelling as per drawing (The actual wording shall be confirmed with the S.O's Representative and as per PBT requirement).	nos	72		
2		<p><u>INTEGRATED SOLAR LED ROAD LIGHTING (LUMINAIRE, COMPONENTS AND ACCESSORIES)</u></p> <p>To supply, deliver, install and test the following as per JKR specification:</p> <p>a) Rate shall include for the supply, deliver, installation, testing and commissioning</p> <p>b) Catalogue showing isolux diagram, utilization factor curves, polar curves of C-Planes 0/180, 90/270, maximum intensity planes, downward light output ratio, downward and upward flux fractions and computer generated print-outs showing all the calculation results of the light distribution on the road surface using the luminaire offered shall be enclosed together.</p> <p>c) IP Rating of IP66 for luminaire construction.</p> <p>d) Appendix A for Integrated Solar LED Road Lighting Technical Compliance shall be filled.</p> <p>e) Minimum requirement : 2.0 cd/m²</p> <p>f) Rate shall based on offered technical specifications and capacity of each components as stated in Appendix B1 L-S20</p> <p>g) Integrated solar LED road lighting luminaire supplied shall complete with 5 years warranty by manufacturer/distributor.</p>				
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB					To Collection Page	

C INTEGRATED SOLAR LED ROAD LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
2.1		High quality ≤150 (120W - 150W) Integrated type Solar LED Road Lighting c/w Solar Photovoltaic (PV) module, LiFePO4 (lithium iron phosphate) battery (2 days autonomy operation), solar charge controller and light source shall be in one enclosure as per specifications mentioned in L-S20. The Integrated Solar LED Road Lighting shall be easily installed, removeable and replaceable as a unit without the use of any special tools and other accessories as per stated in drawings and specifications. The Integrated Solar LED Road Lighting shall be included factory acceptance test (FAT) (Simulation report shall be submitted. Luminaire efficacy shall be rated ≥ 100 lumen/watt.)	nos	88		
2.2		Remote Device to be function as: i) Control light switch ii) Adjust light brightness iii) Set light working mode iv) View and record data / information about device operation which includes at least the following parameters : a) Charge and discharge (Energy and/or Current and Voltage) b) State of Charge (SOC) of the battery	nos	11		
3		<u>PARAPET SERVICE DOOR</u> To supply and install fibre service door for parapet c/w rivet points.	nos	40		
4		<u>NJB COVER</u> To supply and install Hot Dipped Galvanised NJB Cover c/w bolt.	nos	40		

PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE
KG. BERANGAN MEK NAB

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C INTEGRATED SOLAR LED ROAD LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
		<div><div>COLLECTION</div><div>Page C/1/4</div><div>Page C/2/4</div><div>Page C/3/4</div></div>				
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB					To "Ringkasan Tender"	

D VEHICULAR ARCH CULVERT (VAC) SOLAR LED LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
1		<p><u>GENERAL NOTES:</u></p> <p>Final quantities shall be measured upon completion and price will be adjusted accordingly.</p> <p>Supply, install, commissioning and ready to operate for stand alone Solar LED VAC Lighting. Refer to List of Drawing.</p> <p>To supply and install mock up Sample for Solar LED Vehicular Arch Culvert (VAC) at location subject to S.O's Representative.</p> <p>Rates shall include for all operations necessary for the design, manufacture, testing, supply, delivery and installation of all item etc as per drawing.</p> <p>Manufacturer's detail installation proposal, catalogue, technical specifications and data for all offered equipment shall submitted together with the tender for evaluation.Tender with incomplete catalogue and specifications will be rejected.</p> <p><u>PHOTOVOLTAIC (PV) SOLAR PANEL COLUMN AND ACCESSORIES</u></p>				
1.1		10.0 meter height, flange type Hot Dipped Galvanised octagonal steel column for PV Solar Panel Module mounting and other accessories required as per specification and drawing. The word "JKR" shall be embossed on the service door. The Column shall withstand the weight of the PV solar module and the batteries to manufacturer's recommendation and S.O.'s approval.	nos	26		
1.2		To supply and install concrete footing suitable to mount 10.0 meter height column for PV Solar Panel as per approval from C&S Consultant. The contractor shall confirm the size of concrete footing with the road lighting column manufacturer to suit the soil and the dead weight conditions. Final installation subjects to S.O.'s approval.	nos	26		
1.3		Column reflective labelling as per drawing (The actual wording shall be confirmed with the S.O's Representative and as per PBT requirement).	nos	26		
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB					To Collection Page	

D VEHICULAR ARCH CULVERT (VAC) SOLAR LED LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
2		<u>SOLAR LED VAC LIGHTING (LUMINAIRE, COMPONENTS AND ACCESSORIES)</u> To supply, deliver, install and test the following as per JKR specification: a) Rate shall include for the supply, deliver, installation, testing and commissioning b) Catalogue showing isolux diagram, utilization factor curves, polar curves of C-Planes 0/180, 90/270, maximum intensity planes, downward light output ratio, downward and upward flux fractions and computer generated print-outs showing all the calculation results of the light distribution on the road surface using the luminaire offered shall be enclosed together. c) IP Rating of IP66 for luminaire construction. d) Appendix B1 for Solar LED VAC Lighting Technical Compliance shall be filled. e) Minimum requirement : 20 lux f) Rate shall based on offered technical specifications and capacity of each components as stated in Appendix B1 L-S20 g) Solar LED VAC lighting luminaire supplied shall complete with 5 years warranty by manufacturer/distributor.				
2.1		High quality $\geq 30W$ Solar LED floodlight VAC Lighting c/w Solar Photovoltaic (PV) module (integrated PVs enclosure shall be mounted on external column). Column's mounted LiFePO4 (lithium iron phosphate) battery (2 days autonomy operation) integrated with lighting sensor, solar charge controller and converter shall be in one enclosure as per specifications mentioned in L-S20. The Solar LED VAC Lighting shall be easily installed, removeable and replaceable as a unit without the use of any special tools and other accessories as per stated in drawings and specifications. The Solar LED VAC Lighting shall be included factory acceptance test (FAT). (Simulation report shall be submitted. Luminaire efficacy shall be rated ≥ 100 lumen/watt.)	nos	46		
2.2		All the neccessary cabling work in G.I. conduit for the whole system to manufacturer's recommedation and cable sizing to S.O.'s approval.	LS	LS		
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB						To "Ringkasan Tender"

D VEHICULAR ARCH CULVERT (VAC) SOLAR LED LIGHTING

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
		<div><div>COLLECTION</div><div>Page D/1/3</div><div>Page D/2/3</div></div>				
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB					To "Ringkasan Tender"	

E MISCELLANEOUS

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
1		<u>SPARE PARTS FOR ROAD LIGHTING SYSTEM</u>				
		To supply and deliver the following: Spare Part For Road Lighting luminaire (20%) to be handed over to JKR Office as advised by S.O.				
1.1		i) High quality ≤ 180 Watt LED luminaire c/w electronic control gear (driver), built in SPD, thermal management unit and design for both side entry and post top mounting suitable for supply voltage of 230V, 50Hz (on a suitable module unit and shall be easily removable c/w Nema Socket Ready for Smart 7 pin and replaceable as a unit without the use of any special tools) and other accessories as per specifications and drawings. Refer L-S20 Addendum No.1 for SPD.	nos	35		
B		ii) High quality ≤150 (120W - 150W) Integrated type Solar LED Road Lighting c/w Solar Photovoltaic (PV) module, LiFePO4 (lithium iron phosphate) battery, solar charge controller and light source shall be in one enclosure as per specifications mentioned in Addendum 3 of L-S20. The Integrated Solar LED Road Lighting shall be easily installed, removeable and replaceable as a unit without the use of any special tools and other accessories as per stated in drawings and specifications. The Integrated Solar LED Road Lighting shall be included factory acceptance test (FAT)	nos	16		
1.2		Spare Part For SPD (10%) to be handed over to JKR Office as advised by S.O.				
C		Surge Protective Device (SPD) as per details below:	nos	14		
		i) (L-N), nominal discharge current (In) 20kA, 8/20 microsec, max discharge current (Imax) 40kA 8/20 microsec, voltage protection level 1500V@20kA.				
		ii) (N-E) nominal discharge current (In) 20kA 8/20microsec, max discharge current (Imax) 40kA 8/20 microsec voltage protection level 1500V @ 20kA.				
1.3		Spare Part For Modular Termination Box (10%) to be handed over to JKR Office as advised by S.O.				
		Modular Termination Box c/w 15A cut-out fuse assembled in solid panel, suitable for terminations up to 4 core 25 sq.mm PVC/SWA/PVC (Al) cable . The modular termination box shall be manufactured to IP54 with double layer transparent panel/cover.	nos	14		
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB						To Collection Page

E MISCELLANEOUS

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
1.4		Spare Part For Lighting Column (10%) to be handed over to JKR Office as advised by S.O.				
		12.0 meter height , flange type hot dipped galvanised octagonal steel column c/w single/double spigot , two fibre service door double slot hinge with door stiffener and anti vandalism locking device, other accessories as per specification and drawings the word 'JKR' shall be embossed on the service door.	nos	14		
1.5		10.0 meter height , flange type hot dipped galvanised octagonal steel column c/w single/double spigot , two fibre service door double slot hinge with door stiffener and anti vandalism locking device, other accessories as per specification and drawings the word 'JKR' shall be embossed on the service door.	nos	7		
3		<u>ROAD LIGHTING INSTALLATION TESTING REPORT</u>				
C		<p>Allow here or in the rates for the cost of carrying out inspection and tests at works, testing and commissioning of the installation and the equipment of the Sub-Contract Works as required in the relevant Specifications including providing all necessary labour, materials, transportation, appliance or equipment, electricity and fuels, and paying all fees and charges for tests carried out by others.</p> <p>a) Testing and commissioning of the whole road lighting installation using calibrated and appropriate equipment and must include:-</p> <p>i) Luminance (cd/m2) and illuminance (lux) test in accordance with the computer plot.</p> <p>ii) Insulation Resistance, Polarity and Continuity test for all cables. Insulation Resistance test for column to column shall be included.</p> <p>iii) Earth Resistance test at all Earth Chambers.</p> <p>b) All the testing report shall be compiled and submitted to the S.O.'s Representative for approval. A copy shall also be extended to HODT.</p>	LS	LS		
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB					To Collection Page	

E MISCELLANEOUS

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
4		<u>LIAISON WITH AUTHORITY</u> Allow here or in the rates for the cost of liaison with Tenaga Nasional Berhad (TNB) or any other relevant authorities inclusive of all submissions, self service Portal TNB and any charge related to this work	LS	LS		
5		<u>SERVICE AND MAINTENANCE</u> The Electrical Contractor shall make good of any defect, shrinkage and any other faults which may appear within the Defect Liability Period and comprehensive service and maintenance Schedule/Breakdown during the Defects Liability Period as provided in the contract, commencing from Practical Completion of the contract Works as certificate by the S.O.'s (Refer to Appendix G of L-S20)	LS	LS		
PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB					To Collection Page	

E MISCELLANEOUS

Item	Code No.	Description	Unit	Quantity	Rate (RM)	Amount (RM)
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PEMASANGAN ELEKTRIK UNTUK MEMBINA LEBUHRAYA KOTA BHARU KE KUALA KRAI, KELANTAN : BUKIT TIU KE KG. BERANGAN MEK NAB					To "Ringkasan Tender"	