

TERMS OF REFERENCE (TOR)

Lighting System for Coal Handling System

Building B, Park View Executive Suites, Supanuvong Road, Sithannua Village,
Sikottabong District, Vientiane, Lao PDR.
Tel : + 856 21 223911, 222315, 222482, 219381
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Ban Phone Sa-ard, Hongsa District, Xayaboury Province, Lao PDR.
Tel : + 856 74 211794, 266001 (5 lines)
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1. BACKGROUND

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Hongsa Power Company Limited ("**HPC**") is the project operator of the Hongsa mine mouth power plant, a 1,878 MW coal-fired power station located in the Hongsa District, Xayaboury Province, northwestern Lao PDR ("**Site**") approximately 34 km northeast from the Thai-Lao border at the Houay Khon Checkpoint, Chaloen Prakiat District, Nan Province.,

The Concession Period of this Project is 25 years for operation phase. The main project elements comprises of power plant, coal mining, limestone quarry, water resource system and supporting infrastructure facilities. The Power Project consists of 3 x 626 MW Power Plant Units including all project facilities related thereto under the Power Concession Agreement. Lignite coal is used as primary fuel amount of 14 million metric ton per annum and diesel is used for start-up, flame stabilization, and low load operations. A total distance of 182 km transmission lines and substations have been constructed to supply electricity from the Power Plant to the Thai Grids (i.e. 500 kV) and the Lao Grids (i.e. 115 kV) under the EGAT Power Purchase Agreement and the EDL Power Purchase Agreement, respectively.

Coal Handling System is Departments of the Hongsa Power Company is responsible for conveying to stockyard (Incoming lines) and transfer coal to Power Plant (Outgoing Lines) compose of conveyor lines, machines, equipments. Due to Power Plant has operated all the time. Therefore utility system such as Lighting System are necessary for production.

2. PURPOSE

Hongsa Power Company Limited ("**Employer**") wishes to procure the Contractor (the "**Contractor**") who is responsible for the design, supply, delivery, installation, commissioning and quality assurance Lighting System. All parts and equipments shall be new, genuine, good quality, standardized and availability. Beside the Contractor shall complete any services portion as conditions and completion time specified herein.

3. ELIGIBILITY OF BIDDER

3.1 The Bidder shall be a juristic person.

3.2 The Bidder shall not be the people involved (such as advisor or employee) of Hongsa Power Company Limited.

3.3 The Bidder shall have the experience in designing and contracting the Lighting System for 5 projects at least within the last 5 years. (Each project must have project value not less than one million THB.)

3.4 The Bidder shall have the legal authority to execute the bidding offer according to this bidding document.

3.5 The Bidder shall have authorized capital not less than one million THB.

3.6 The Bidder will submit the required document as follows:

3.6.1 Technical proposal

- Design calculations and criteria which clearly describe the calculations and design with submit preliminary drawing.

- Technical confirmation data by completely filled up the table according to Annex III: Technical confirmation for Lighting System
- Technical Bid Evaluation by completely filled up the table according to Annex II: TBE (Technical Bid Evaluation)
- Overall work schedule.
- Detail of materials, electrical parts and equipments.
- Load consumption calculation and electrical diagram.
- Support documents such as catalogues and manual of equipments etc.

3.6.2 Financial proposal

- The price quotation and Bill Of Quantities(BOQ) according to Annex I: Price Bid
- The quotation shall remain valid for a period of 120 days from the date of the submission.
- Price Bid data by completely filled up the table according to Annex I: Price Bid

4. SCOPE OF WORK AND TIME FOR COMPLETION

4.1 SCOPE OF AREA

The Contractor shall be responsible for the design, supply, delivery, installation, commissioning and quality assurance the Lighting System under safety rules area follow as:

- a) Coal stockyard3
- b) Crane parking
- c) Street Lighting (Mine equipment maintenance workshop)
- d) Secondary Crusher
- e) Head Station Conveyor C1.1, 2.1, CR1, CR2, CR3
- f) Walk way CP1.1, CP 2.1
- g) Transformer area (Beside Secondary Crusher)
- h) Indoor and outdoor store yard

4.2 DETAIL OF INSTALLATION

Detail of installation according to term and subject to Annex V Detail of installation and Employer's requirement

4.3 EQUIPMENT AND INSTALLATION STANDARD

- a) Electrical cable following as IEC Standard or equivalent standard at least
- b) Equipment following as Annex V: Detail of installation and Employer's requirement
- c) Electrical equipment following as IEC Standard and Annex V: Detail of installation and Employer's requirement. And have dust/water resistant ability IP65 at least.
- d) The Illumination level standards following as Annex V: Detail of installation and Employer's requirement
- e) Electrical Installation following as Annex V: Detail of installation and Employer's requirement

4.4 SCOPE OF EMPLOYER SUPPLY

The employer provides necessary facilities and utilities for installation follows as,

- a) Electrical power supply source (not included electrical cable, power plug)
- b) Storage yard and necessary areas where the contractor require.
- c) The Employer provided Boom Lift and Crane, In case of job overlapped. The employer's job is first priority.
- d) Other than the mentioned above, the employer is not provided.

4.5 SCHEDULE OF DOCUMENT SUBMISSION

From the contract signing date, the Contractor shall submit documents as the following schedule:

Document	Submission Date
1. Drawings/Electrical diagram submission schedule	15 Days from the contract signing date
2. Overall works schedule	15 Days from the contract signing date
3. Drawings/Electrical diagram and equipment specification for approval	Refer to Drawing submission schedule
4. Final Drawings/Electrical diagram	60 Days from the contract signing date
5. Method Statements for installation	15 Days from the contract signing date

4.6 DOCUMENTATION

The Contractor shall submit documents which are comprised of 4 sets of hard copies and PDF & AutoCAD files. The Employer shall review such documents within 14 days after receiving from the Contractor. After the review and approval of drawings and documents, in case of any comments from the Employer, the Contractor shall rectify such comments and submit the revised version within 14 days. The final drawings/Electrical diagram and equipment specification for installation shall be submitted in 4 sets of hard copies and PDF & AutoCAD files to the Employer as per below details :

- Final drawings for manufacturing are required to be signed by the licensed engineer of the Contractor and stamped the signing date.
- In case the Employer found the mistake of final drawings/Electrical diagram, the Contractor shall revise and correct drawing/Electrical diagram as soon as possible.
- In case the design and installation work cause the misapplication of any part or equipment, the Contractor shall request an approval from the Employer for correction

The Contractor has acknowledged that any approval from the Employer shall not release or discharge any responsibilities or obligations of the Contractor.

4.7 COMPLETION DATE

The Contractor shall, in due time and in conformity with the progress of the works, perform installation and commissioning within 31 December 2016

5. SPECIFICATION AND WORK CONDITIONS

Specification conditions of works according to term and subject to Annex III: Technical confirmation for Lighting System and Annex V: Detail of installation and Employer's requirement

6. SUBMISSION OF PROPOSAL

Conforming Bidder shall be submitted in duplicate in the form of Bidding included in these documents. The Bidder shall include in its bidding the following:

- (i) Completely filled up Price Bid Form (Annex I)
- (ii) Completely filled up the Technical Bid Evaluation Form (Annex II)
- (iii) Completely filled up the Technical confirmation for Lighting System (Annex III)
- (iv) Other necessary supported documents

Any Bidder that is not accompanied by these items or as specified in Bidding Process and Conditions may be rejected. The Bidder shall not alter or add to any tender document except as required by these Conditions of tender. The Bidder shall complete and duly execute the Form of Bidding before submitting the same.

The Bidder shall be visited the installation area at Hongsa site which will be held on 22 September 2016 before submission the proposal.

The Bidder shall be submitted in two sealed envelopes, each envelope shall contain separately financial proposal and technical proposal one. The submission shall be addressed to HPC's Office at the address below, not later than 17:00 a.m. local time on the day of 07 October 2016.

Hongsa Power Company Limited

Attention: Mr. Phusit Apichartviwat (Section Manager - Procurement-Technical)
3/33 Worravichai road, Niweing, Meung District
NAN, 55000, THAILAND
Or

Hongsa Power Company Limited

Attention: Mr. Phusit Apichartviwat (Section Manager - Procurement-Technical)
Phufai Camp Office, Hongsa District
Xayaboury Province., LAO PDR.

7. ACCEPTANCE AND REJECTION OF PROPOSALS

The HPC reserves the right, at its sole discretion, to accept the Proposal which in its judgment is the most responsive and best Proposal, to reject any and all Proposals, and to waive minor irregularities and informalities in any Proposal submitted. The HPC will reject any Proposal which, in his judgment, is non-responsive. The HPC will not be bound to award a contract to the Supplier who has submitted a Proposal indicating the lowest price, but will take into account all evaluating factors and other factors such as compliance with the TOR Documents, technical and financial qualification, and capability of the Supplier to execute the Works promptly and vigorously in such manner as to secure delivery and/or completion within the time specified.

8. TOR DOCUMENTS

- a) Term of Reference
- b) Annex I: Price Bid
- c) Annex II: TBE (Technical Bid Evaluation)
- d) Annex III: Technical Confirmation for Lighting System
- e) Annex IV: Schedule of Installation Lighting System
- f) Annex V: Detail of installation and Employer's requirement
- g) Annex VI: Reference Drawing

9. REQUIRED DOCUMENTS

- a) Completely filled up the Annex I
- b) Completely filled up the Annex II
- c) Completely filled up the Annex III
- d) Other necessary supported documents

10. VALIDITY OF PROPOSAL

The Proposal shall be valid for a period of one hundred twenty (120) days from the date of the submission of the Final Proposal, which is 28 January 2017.

11. CONTRACTOR OBLIGATIONS

The Contractor shall take full responsibility for the adequacy, stability and safety of all operations and methods of construction under the contract and comply with all applicable Safety and Environmental Laws and requirements, including the Operation Phase Environmental Management and Monitoring Plan (OPEMMP) as attached.

12. WARRANTY PERIOD

The Contractor shall guarantee the proper functioning of the equipment and works for a period of 12 months from the day after the pass Taking-Over Certificate issuance following the date that acceptance together of the Work by HPC (“**Defects Notification Period**”). If found any defect or damage and can be proved that design or installation fault, Contractor shall repair or replace such defect within 30 days from Defects Notification Report

13. WORK ACCEPTANCE CONDITION

- a) Inspection and prior to the delivery.

When prior to delivery, the employer shall be inspection and testing major part first and employer shall issue the inspection document. If the result of such inspection or testing not related with clause the contractor shall immediately take action to ensure conformity of such part or equipments, on the other hand employer can be rejected. Rejected components and materials shall be removed from the site by the Contractor within 15 days

- b) Commissioning

Commission test are referred to arrangement of specification between employer and contractor. After commissioning and performance test result shall be passed following as clause that was written by employer:

- Works has been passed the test completion.
- Not found major defect

Within 30 days after pass commission and performance test, the contractor shall submit commissioning report to employer

c) Documentations

After complete of commission and performance test contractor shall submit maintenance manual and drawings/electrical diagram to employer composed of 4 sets of hard copy document and PDF&DWG files.

14. TERMS OF PAYMENT

a) The first payment in the amount twenty percent (20%) of the contract price shall be Payable upon the contract signing and the receipt the Advance Payment Bond twenty percent (20%) of contract price.

b) The second payment in the amount fifty percent (50%) of contract price shall be Payable upon bellows,

- i) After approval of installation drawing.
- ii) After delivery one hundred percent (100%)

c) The third payment in the amount twenty percent (20%) of contract price shall be Payable upon the completion of installation

d) The final payment in the amount ten percent (10%) of contract price shall be Payable upon the completion of commissioning and issuance of the taking-Over Certificate provided that the warranty bond has been submitted to the Employer.

15. PERFORMANCE BOND AND WARRANTY BOND

16.1 Performance bond

The Contractor shall deliver the Employer the performance bond in the amount of ten percent (10%) of the total contract price. The performance bond shall be covered since the contract signing date until time for completion (within 270 days from the contract signing date).

16.2 Warranty bond

The Contractor shall deliver the Employer the warranty bond in the amount of 10% of the total contract price. The warranty bond shall be covered for the period of 12 months after the pass of trial run.

16.3 Advance Payment Bond

The Contractor shall deliver the Employer the Advance payment bond in the amount of 20% of the total contract price. As per the condition of first payment in subject 14(a).

The Employer shall return the above mentioned bonds to the Contractor without accruing any interest.

16. DELAY LIQUIDATION

If the Contractor fails to achieve the completion of Works (by performing Test on Completion) at completion date as specified in the Notice to Proceeds under clause. The Contractor shall pay delay liquidated damages in the amount of 0.1% (zero point one percent) of the total contract price for each day of delay. However, the total delay liquidated damages shall not exceed 10% (ten percent) of the total contract price.

ANNEX I

Table 1: Price Bid

Item	Description	Amount	unit	Unit price (THB)	Total price (THB)
1	Coal stockyard Bay 3	1	System		
2	Crane parking	1	System		
3	Street Lighting (Mine equipment maintenance workshop)	1	System		
4	Secondary Crusher	10	point		
5	Head Station Conv. C1.1, 2.1, CR1, CR2, CR3	10	point		
6	Walk way CP1.1, CP 2.1	2	point		
7	Transformer area (Beside Secondary Crusher)	5	point		
8	Indoor and outdoor store yard	1	System		
Summary price					

Table 2: Detail Price Bid

Item	Description	Amount	unit	Unit price (THB)	Total price (THB)
1	Coal stockyard Bay 3	1	System		
	-Transformer				
	-Lighting				
	-Electrical cable				
	-Electrical cable management part (Conduit, fitting)				
	-Electrical cabinet (with components)				
	-Labor cost				
2	Crane parking	1	System		
	-Lighting				
	-Electrical pole				
	-Electrical cable				
	-Electrical cabinet (with components)				
	-Concrete foundation				
	- Electrical cable management part (HDPE, conduit)				
	- Labor cost				
3	Street Lighting (Mine equipment maintenance workshop)	1	System		
	-Lighting				
	-Electrical pole				
	-Electrical cable				
	-Electrical cabinet (with components)				
	-Concrete foundation				
	- Electrical cable management part (HDPE, conduit)				
	- Labor cost				

Item	Description	Amount	unit	Unit price (THB)	Total price (THB)
4	Secondary Crusher	10	point		
	-Lighting				
	-Electrical cable				
	-Electrical cabinet (with components)				
	-Labor cost				
5	Head Station Conv. C1.1, 2.1, CR1, CR2, CR3	10	point		
	-Lighting				
	-Electrical cable				
	-Labor cost				
6	Walk way CP1.1, CP 2.1	2	point		
	-Lighting				
	-Labor cost				
7	Transformer area (Beside Secondary Crusher)	5	point		
	-Lighting				
	-Electrical cable				
	-Labor cost				
8	Indoor and outdoor store yard	1	System		
	-Lighting				
	-Electrical pole				
	-Electrical cable				
	-Electrical cabinet (with components)				
	-Concrete foundation				
	- Electrical cable management part (Conduit,Fitting)				
	- Labor cost				
Summary price					

ANNEX II: TBE

Table 2: Commercial Confirmation

NO	DESCRIPTON	REQUIREMEN	BIDDER CONFIRMATION
1	SCOPE OF EMPLOYER SUPPLY		
	a) Electrical power supply	Employer Provide electrical power supply (not include electrical cable, power plug)	
	b) Storage yard and necessary areas	Employer Provide storage yard and necessary areas where the contractors require.	
	c) Boom Lift and Crane	The Employer provided Boom Lift and Crane (In case of job overlapped, The employer's job is first priority)	
	d) Other than the mentioned above	Other than the mentioned above, the Employer is not provided.	
2	VALIDITY OF PROPOSAL	120 Days	
3	DELIVERY	By supplier	
4	COMPLETION DATE	Within 31 December 2016	
5	WARRANTY	12 months after Taking-Over Certificate issuance	
6	TERMS OF PAYMENT		
	First Payment	The first Payment in the amount twenty percent (20%) of the contract price shall be Payable upon the contract signing and the receipt the Advance Payment Bond twenty percent (20%) of contract price	
	Second Payment	The second Payment in the amount fifty percent (50%) of contract price shall be Payable upon ; i) After approval of installation drawing. ii) After delivery one hundred percent (100%)	
	Third Payment	The third Payment in the amount twenty percent (20%) of contract price shall be Payable upon the completion of installation	
	Final Payment	The final Payment in the amount ten percent (10%) of contract price shall be Payable upon the completion of commissioning and issuance of the taking-Over Certificate provided that the warranty bond has been submitted to the Employer.	

ANNEX III: TECHNICAL CONFIRMATION

Table 3: Technical Data of Lighting System

NO.	DESCRIPTION	SCOPE OF SUPPLY	BIDDER CONFIRMATION
1.Coal stockyard3			
	Preparation work		
	Preparation Storage yard	HPC Provide	
	Preparation Installation area	HPC Provide	
	Preparation equipments, parts, toolings for installation work	By Supplier	
	Preparation steel for lighting support	By Supplier	
	Structure & Transportation		
	Boom Lift and Crane	HPC Provide	
	Installation lighting lamp	By Supplier	
	Transportation	By Supplier	
	Other than the mentioned above	By Supplier	
	Electrical		
	Switch ON-OFF Electrical power supply	HPC Provide	
	Preparation electrical power supply (Only power source not include breaker, cable etc.)	HPC Provide	
	Preparation Transformer 50 kV	By Supplier	
	Preparation electrical cable, conduit	By Supplier	
	Preparation equipment	By Supplier	
	Installation Transformer	By Supplier	
	Installation electrical cabinet	By Supplier	
	Electrical cable wiring	By Supplier	
	Installation cable conduit (include cable management)	By Supplier	
	Commissioning Test		
	Interface Electric system with equipment	By Supplier	
	Testing and Report	By Supplier	
	After work		
	Removed equipment and/or part that no need from the site	By Supplier	
2. Crane parking			
	Preparation work		
	Preparation Storage yard	HPC Provide	
	Preparation Installation area	HPC Provide	
	Preparation equipments, parts, toolings for installation work	By Supplier	
	Preparation steel for lighting support	By Supplier	
	Preparation electrical pole	By Supplier	
	Structure & Transportation		
	Boom Lift and Crane	HPC Provide	
	Installation electrical pole with concrete foundation	By Supplier	
	Installation lighting lamp with pole	By Supplier	

NO.	DESCRIPTION	SCOPE OF SUPPLY	BIDDER CONFIRMATION
	Installation HDPE Tube for Electrical cable (Underground)	By Supplier	
	Transportation	By Supplier	
	Other than the mentioned above	By Supplier	
	Electrical		
	Switch ON-OFF Electrical power supply	HPC Provide	
	Preparation electrical power supply (Only power source not include breaker, cable etc.)	HPC Provide	
	Preparation electrical cable, cable conduit	By Supplier	
	Preparation equipment	By Supplier	
	Installation electrical cabinet	By Supplier	
	Electrical cable wiring	By Supplier	
	Installation cable (include cable management) with electrical pole	By Supplier	
	Commissioning Test		
	Interface Electric system with equipment	By Supplier	
	Testing and Report	By Supplier	
	After work		
	Removed equipment and/or part that no need from the site	By Supplier	
3. Street Lighting (Mine equipment maintenance workshop)			
	Preparation work		
	Preparation Storage yard	HPC Provide	
	Preparation Installation area	HPC Provide	
	Preparation equipments, parts, toolings for installation work	By Supplier	
	Preparation steel for lighting support	By Supplier	
	Preparation electrical pole	By Supplier	
	Structure & Transportation		
	Boom Lift and Crane	HPC Provide	
	Installation electrical pole with concrete foundation following as attached DWG	By Supplier	
	Installation lighting lamp with pole	By Supplier	
	Installation HDPE Tube for Electrical cable (Underground)	By Supplier	
	Transportation	By Supplier	
	Other than the mentioned above	By Supplier	
	Electrical		
	Switch ON-OFF Electrical power supply	HPC Provide	
	Preparation electrical power supply (Only power source not include breaker, cable etc.)	HPC Provide	
	Preparation electrical cable, cable conduit	By Supplier	
	Preparation equipment	By Supplier	
	Installation electrical cabinet	By Supplier	
	Electrical cable wiring	By Supplier	
	Installation cable (include cable management) with electrical pole	By Supplier	

NO.	DESCRIPTION	SCOPE OF SUPPLY	BIDDER CONFIRMATION
	Commissioning Test		
	Interface Electric system with equipment	By Supplier	
	Testing and Report	By Supplier	
	After work		
	Removed equipment and/or part that no need from the site	By Supplier	
4.Secondary Crusher			
	Preparation work		
	Preparation Storage yard	HPC Provide	
	Preparation Installation area	HPC Provide	
	Preparation equipments, parts, toolings for installation work	By Supplier	
	Preparation steel for lighting support	By Supplier	
	Structure & Transportation		
	Installation lighting lamp	By Supplier	
	Transportation	By Supplier	
	Other than the mentioned above	By Supplier	
	Electrical		
	Switch ON-OFF Electrical power supply	HPC Provide	
	Preparation electrical power supply (Only power source not include breaker, cable etc.)	HPC Provide	
	Preparation electrical cable, conduit	By Supplier	
	Preparation equipment	By Supplier	
	Installation electrical cabinet	By Supplier	
	Electrical cable wiring	By Supplier	
	Installation cable conduit (include cable management)	By Supplier	
	Commissioning Test		
	Interface Electric system with equipment	By Supplier	
	Testing and Report	By Supplier	
	After work		
	Removed equipment and/or part that no need from the site	By Supplier	
5.Head Station Conveyor C1.1, 2.1, CR1, CR2, CR3			
	Preparation work		
	Preparation Storage yard	HPC Provide	
	Preparation Installation area	HPC Provide	
	Preparation equipments, parts, toolings for installation work	By Supplier	
	Preparation steel for lighting support	By Supplier	
	Structure & Transportation		
	Installation lighting lamp	By Supplier	
	Transportation	By Supplier	
	Other than the mentioned above	By Supplier	
	Electrical		
	Switch ON-OFF Electrical power supply	HPC Provide	

NO.	DESCRIPTION	SCOPE OF SUPPLY	BIDDER CONFIRMATION
	Preparation electrical power supply (Only power source not include breaker, cable etc.)	HPC Provide	
	Preparation electrical cable, conduit	By Supplier	
	Preparation equipment	By Supplier	
	Installation electrical cabinet	By Supplier	
	Electrical cable wiring	By Supplier	
	Installation cable conduit (include cable management)	By Supplier	
	Commissioning Test		
	Interface Electric system with equipment	By Supplier	
	Testing and Report	By Supplier	
	After work		
	Removed equipment and/or part that no need from the site	By Supplier	
6.Walk way CP1.1, CP 2.1			
	Preparation work		
	Preparation Storage yard	HPC Provide	
	Preparation Installation area	HPC Provide	
	Preparation equipments, parts, toolings for installation work	By Supplier	
	Preparation steel for lighting support	By Supplier	
	Structure & Transportation		
	Installation lighting lamp	By Supplier	
	Transportation	By Supplier	
	Other than the mentioned above	By Supplier	
	Electrical		
	Switch ON-OFF Electrical power supply	HPC Provide	
	Preparation electrical power supply (Only power source not include breaker, cable etc.)	HPC Provide	
	Preparation electrical cable, conduit	By Supplier	
	Preparation equipment	By Supplier	
	Electrical cable wiring	By Supplier	
	Commissioning Test		
	Interface Electric system with equipment	By Supplier	
	Testing and Report	By Supplier	
	After work		
	Removed equipment and/or part that no need from the site	By Supplier	
7.Transformer area (Beside Secondary Crusher)			
	Preparation work		
	Preparation Storage yard	HPC Provide	
	Preparation Installation area	HPC Provide	
	Preparation equipments, parts, toolings for installation work	By Supplier	
	Preparation steel for lighting support	By Supplier	

NO.	DESCRIPTION	SCOPE OF SUPPLY	BIDDER CONFIRMATION
	Structure & Transportation		
	Installation lighting lamp	By Supplier	
	Other than the mentioned above	By Supplier	
	Electrical		
	Switch ON-OFF Electrical power supply	HPC Provide	
	Preparation electrical power supply (Only power source not include breaker, cable etc.)	HPC Provide	
	Preparation electrical cable, conduit	By Supplier	
	Preparation equipment	By Supplier	
	Installation electrical cabinet	By Supplier	
	Electrical cable wiring	By Supplier	
	Installation cable conduit (include cable management)	By Supplier	
	Commissioning Test		
	Interface Electric system with equipment	By Supplier	
	Testing and Report	By Supplier	
	After work		
	Removed equipment and/or part that no need from the site	By Supplier	
8. Indoor and outdoor store yard			
	Preparation work		
	Preparation Storage yard	HPC Provide	
	Preparation Installation area	HPC Provide	
	Preparation equipments, parts, toolings for installation work	By Supplier	
	Preparation steel for lighting support	By Supplier	
	Structure & Transportation		
	Installation lighting lamp	By Supplier	
	Transportation	By Supplier	
	Other than the mentioned above	By Supplier	
	Electrical		
	Switch ON-OFF Electrical power supply	HPC Provide	
	Preparation electrical power supply (Only power source not include breaker, cable etc.)	HPC Provide	
	Preparation electrical cable, conduit	By Supplier	
	Preparation equipment	By Supplier	
	Installation electrical cabinet	By Supplier	
	Electrical cable wiring	By Supplier	
	Installation cable conduit (include cable management)	By Supplier	
	Commissioning Test		
	Interface Electric system with equipment	By Supplier	
	Testing and Report	By Supplier	
	After work		
	Removed equipment and/or part that no need from the site	By Supplier	

NO.	DESCRIPTION	SCOPE OF SUPPLY	BIDDER CONFIRMATION
9. Equipment Specification/Brand Confirmation			
	9.1 Lighting		
	a) Brand : PHILIPS, L&E, Luminaire, SYLVANIA, PANASONIC	By Supplier	
	b) Country of origin : Japan, Thailand Europe	By Supplier	
	9.2 Electrical cable		
	a) Brand : Bangkok cable, Thai Yazaki, Prysmian, Nexans, Phelps Dodge	By Supplier	
	b) Country of origin : Thailand, Europe	By Supplier	
	9.3 Electrical Pole specification		
	Material: Steel Hot-dipped galvanized Height: 9 m (For street lighting) 12m (For crane parking) Thickness: 4.00 mm. at least	By Supplier	
	9.4 Lighting Pole Foundation		
	a) For Pole 9 m.		
	Upper foundation Concrete 0.40 x 0.40 m Lower foundation Concrete 0.80 x 0.80 m Height 1.2 m.	By Supplier	
	b) For Pole 12 m.		
	Upper foundation Concrete 0.50 x 0.50 m Lower foundation Concrete 1.00 x 1.00 m Height 1.5m.	By Supplier	
	**Detail of specification and installation following as attached DWG	By Supplier	
	9.5 Transformer 50 kV		
	a) Brand : TIRATHAI, EKARAT, Thai Patanakit, QTC, ABB	By Supplier	
	b) Country of origin : Thailand, Europe	By Supplier	

ANNEX IV: SCHEDULE OF INSTALLATION LIGHTING SYSTEM

No.	Description	Target date	August				September				October				November				December				
			W32	W33	W34	W35	W36	W37	W38	W39	W40	W41	W42	W43	W44	W45	W46	W47	W48	W49	W50	W51	W52
1	Terms Of Reference approval	20-Aug-16																					
2	Site visit at Hongsa Power Company (Laos PDR)	19-Sep-16																					
3	Proposal Submission	7-Oct-16																					
4	Final Committee meeting	14-Oct-16																					
5	Senior management meeting	19-Oct-16																					
6	Contact signing	31-Oct-16																					
7	Delivery at Hongsa Power Company (Laos PDR) site	10-Dec-16																					
8	Installation and Commissioning Completion	31-Dec-16																					

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ANNEX V: DETAIL OF INSTALLATION AND EMPLOYER'S REQUIREMENT

1. GENERAL

1.1 Scope

This Employer's requirement including scope of the design, supply, delivery, installation, commissioning and quality assurance the Lighting System under safety rules area follow as:

- a) Coal stockyard3
- b) Crane parking
- c) Street Lighting (Mine equipment maintenance workshop)
- d) Secondary Crusher
- e) Head Station Conveyor C1.1, 2.1, CR1, CR2, CR3
- f) Walk way CP1.1, CP 2.1
- g) Transformer area (Beside Secondary Crusher)
- h) Indoor and outdoor store yard

1.2 General Area Description

a) Coal stockyard3

Location :	Coal stockyard Bay 3
Operating time :	24 Hours per day, 7 Days per week
Area Description:	Indoor Stockyard 53,040 Sq.m. (680x78 m) ; Height 20 m
Power supply source :	22 kV
Distance(Between power supply to first equipment)	15 m.

b) Crane parking

Location :	Crane parking area Mine equipment workshop HPC
Operating time :	24 Hours per day, 7 Days per week
Area Description:	Outdoor 5,000 Sq.m. (100x50 m.)
Power supply source :	400 V _{L-L}
Distance(Between power supply to first equipment)	Less than 100 m

c) Street Lighting (Mine equipment maintenance workshop)

Location :	Road around Mine equipment maintenance workshop HPC
Operating time :	24 Hours per day, 7 Days per week
Area Description:	Outdoor road
Power supply source :	400 V _{L-L}
Distance(Between power supply to first equipment)	Less than 100 m
Pole to pole distance	Not less than 30 m

d) Secondary Crusher

Location :	Secondary Crusher area HPC
Operating time :	24 Hours per day, 7 Days per week
Area Description:	3Floors Building 300 Sq.m. (15x20 m) ; Height 20 m
Power supply source :	220 Vac
Distance(Between power supply to first equipment)	50 m

e) Head Station Conveyor C1.1, 2.1, CR1, CR2, CR3

Location :	Head Station Conveyor C1.1, 2.1, CR1, CR2, CR3
Operating time :	24 Hours per day, 7 Days per week
Area Description :	Outdoor
Power supply source :	220 Vac
Distance(Between power supply to first equipment)	50 m

f) Walk way CP1.1, CP 2.1

Location :	Walk way CP1.1, CP 2.1
Operating time :	24 Hours per day, 7 Days per week
Area Description:	Outdoor
Power supply source :	220 Vac
Distance(Between power supply to first equipment)	Less than 5m (Installation mounted electrical pole)

g) Transformer area (Beside Secondary Crusher)

Location :	Transformer area (Beside Secondary Crusher)
Operating time :	24 Hours per day, 7 Days per week
Area Description:	Outdoor
Power supply source :	220 Vac
Distance(Between power supply to first equipment)	Less than 10 m.

h) Indoor and outdoor store yard

Location :	Indoor and outdoor store yard
Operating time :	24 Hours per day, 7 Days per week
Area Description:	Outdoor/Indoor
Power supply source :	220 Vac
Distance(Between power supply to first equipment)	Less than 50 m.

1.3 Standard Requirement

No.	Description	Standard Reference
1	Electrical cable	IEC Standard and Design Feature Requirement
2	Cable sizing and selection	IEC Standard
3	Equipment	As per Design Feature Requirement
4	Electrical Equipment	IEC Standard or equivalent standard and has a dust/water resistant ability IP65 at least.
5	Illumination level standards	As per Design Feature Requirement
6	Electrical Installation Standard	As per Design Feature Requirement

2. DESIGN FEATURE REQUIREMENT

a) Coal stockyard³

Types of lamp	Hi Pressure Sodium
Amount of Lighting lamp	Not less than 46 sets
Illumination value	More than 150 lux
Feature	ON/OFF according to the external brightness measured by photo cell. And switch ON/OFF operation
Power consumption	Less than 400W/LAMP
Power supply source :	220 VAC
Protection	IP 65 up
Installation height	15 m.
Cable Type	VCT Type
Cable management	PVC Conduit

b) Crane parking

Types of lamp	LED
Amount of Lighting lamp	Not less than 15 sets
Illumination value	More than 125 lux
Feature	ON/OFF according to the external brightness measured by photo cell. And switch ON/OFF operation
Power consumption	Less than 300W/LAMP
Power supply source :	220 VAC
Protection	IP 65 up
Installation height	More than 10 m. (Pole-mounted)
Cable Type	VCT Type
Cable management	HDPE Tube specification not less than class : PE80 PN10 (Underground), Cable wiring inside Electrical pole

c) Street Lighting (Mine equipment maintenance workshop)

Types of lamp	High intensity discharge(HID) / LED
Amount of Lighting lamp	Not less than 35 sets
Illumination value	More than 21.5 lux
Feature	ON/OFF according to the external brightness measured by photo cell. And switch ON/OFF operation
Power consumption	Less than 400W/LAMP
Power supply source :	3-Phase
Protection	IP 65 up

Installation height	less than 9 m.
Cable Type	NYT Type
Cable management	HDPE Tube specification not less than class : PE80 PN10 (Underground), Cable wiring inside Electrical pole

d) Secondary Crusher

Types of lamp	LED Lamp
Amount of Lighting lamp	Not less than 10 sets
Illumination value	More than 150 lux
Feature	ON/OFF according to the external brightness measured by photo cell. And switch ON/OFF operation
Power consumption	Less than 200W/LAMP
Power supply source :	220 VAC
Protection	IP 65 up
Installation height	less than 7 m.
Cable Type	VCT Type
Cable management	Conduit or Cable tray

e) Head Station Conveyor C1.1, 2.1, CR1, CR2, CR3

Types of lamp	LED
Amount of Lighting lamp	Not less than 10 sets
Illumination value	More than 125 lux
Feature	ON/OFF according to the external brightness measured by photo cell. And switch ON/OFF operation
Power consumption	Less than 200W/LAMP
Power supply source :	220 VAC
Protection	IP65 up
Installation height	5 m
Cable Type	VCT Type
Cable management	Conduit or Cable tray

f) Walk way CP1.1, CP 2.1

Types of lamp	LED
Amount of Lighting lamp	Not less than 2 sets
Illumination value	More than 125 lux
Feature	ON/OFF according to the external brightness measured by photo cell. And switch ON/OFF operation
Power consumption	Less than 400W/LAMP
Power supply source :	220 VAC
Protection	IP65 up
Installation height	12 m (Pole-mounted)
Cable Type	VCT Type
Cable management	-

g) Transformer area (Beside Secondary Crusher)

Types of lamp	Hi Pressure Sodium / LED
Amount of Lighting lamp	Not less than 5 sets
Illumination value	More than 125 lux

Feature	ON/OFF according to the external brightness measured by photo cell. And switch ON/OFF operation
Power consumption	Less than 300W/LAMP
Power supply source :	220 VAC
Protection	IP65 up
Installation height	7 m
Cable Type	VCT Type
Cable management	PVC Conduit

h) Indoor and outdoor store yard

Types of lamp	Hi Pressure Sodium / LED
Amount of Lighting lamp	Not less than 20 sets
Illumination value	More than 125 lux
Feature	ON/OFF according to the external brightness measured by photo cell. And switch ON/OFF operation
Power consumption	Less than 400W/LAMP
Power supply source :	220 VAC
Protection	IP65 up
Installation height	7 m / 12m (Pole mounted)
Cable Type	VCT Type
Cable management	Conduit