

Notice to Bidder

To comply with the ENGINEER ACT, B.E. 2542 FOR THE CONSTRUCTION WORK RELATED TO DESIGN OR CONSTRUCTION SUPERVISION WORK

The Contractors should be aware of the following:

1. The Contractor who is a juristic person is required to obtain a License to Practice the Controlled Engineering Profession issued by the Council of Engineers Thailand.
2. Where the Contractor is a joint venture or consortium, the Contractor shall comply with the following requirements: -
 - 1) In case of a joint venture, the joint venture is required to obtain a License to Practice the Controlled Engineering Profession issued by the Council of Engineers Thailand.
 - 2) In case of a consortium, only the member of the consortium who will be responsible for the Design or Construction Supervision Work is required to obtain a License to Practice the Controlled Engineering Profession issued by the Council of Engineers Thailand.

NOTE : If you have any questions, please contact COUNCIL OF ENGINEERS THAILAND.

Address : 1616/1 Ladprao, Wangthonglang, Bangkok, Thailand 10310

Telephone : 1303

Email : coe@saraban.mail.go.th

ประชาสัมพันธ์ผู้ประกอบการเพื่อทราบ

เพื่อให้การดำเนินงานสำหรับงานจ้างก่อสร้างที่มีลักษณะงานด้านการออกแบบหรือควบคุมงานก่อสร้าง สอดคล้องกับพระราชบัญญัติวิศวกร พ.ศ. 2542 จึงขอแจ้งแนวทางในการดำเนินงาน ดังนี้

1. ผู้รับจ้างที่เป็นนิติบุคคล ต้องเป็นผู้ที่ได้รับใบอนุญาตประกอบวิชาชีพวิศวกรรมควบคุมสำหรับนิติบุคคลจากสภาวิศวกร
2. ผู้รับจ้างที่ดำเนินการในรูปแบบของ “กิจการร่วมค้า”
 - (1) กรณีที่กิจการร่วมค้าได้จดทะเบียนเป็นนิติบุคคลใหม่ กิจการร่วมค่านั้นต้องเป็นผู้ที่ได้รับใบอนุญาตประกอบวิชาชีพวิศวกรรมควบคุมสำหรับนิติบุคคลจากสภาวิศวกร
 - (2) กรณีที่กิจการร่วมค้าไม่ได้จดทะเบียนเป็นนิติบุคคลใหม่ เฉพาะนิติบุคคลที่มีหน้าที่เป็นผู้รับผิดชอบงานวิศวกรรมออกแบบหรือควบคุม ต้องเป็นผู้ที่ได้รับใบอนุญาตประกอบวิชาชีพวิศวกรรมควบคุมสำหรับนิติบุคคลจากสภาวิศวกร

หมายเหตุ หากมีข้อสงสัย โปรดติดต่อ สภาวิศวกร

ที่อยู่ : 1616/1 ถนนลาดพร้าว แขวงวังทองหลาง เขตวังทองหลาง กรุงเทพมหานคร 10310

เบอร์ติดต่อ : 1303

อีเมล : coe@saraban.mail.go.th

EGAT's Privacy Notice on Procurement, Inventory Management and Contract Administration

Electricity Generating Authority of Thailand (EGAT) has performed the protection of the Personal Data regarding procurement, inventory management and contract administration to be in accordance with the **Personal Data Protection Act B.E. 2562** (the "2019 PDPA"), which comes into effect on June 1, 2022.

Details about EGAT's Privacy Notice on Procurement, Inventory Management and Contract Administration are available for you at https://www.egat.co.th/privacy-notice-procurement_en.html or the below QR Code.



The Redaction of Sensitive Personal Data

EGAT has announced the Privacy Notice on Procurement, Inventory Management and Contract Administration for the collection, use or disclosure of Personal Data, excluding the Sensitive Personal Data.

Should the documents you wish to submit to EGAT contain the Sensitive Personal Data as defined in Section 26 of the 2019 PDPA, pertaining to racial, ethnic origin, political opinions, cult, religious or philosophical beliefs, sexual behavior, criminal records, health data, disability, trade union information, genetic data, biometric data, or of any data which may affect you in the same manner, you shall redact or conceal such data before submitting to EGAT.

ประกาศความเป็นส่วนตัว (Privacy Notice) สำหรับการจัดซื้อจัดจ้าง การบริหารพัสดุ และการบริหารสัญญาของ กฟผ.

การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.) ได้ดำเนินการคุ้มครองข้อมูลส่วนบุคคลสำหรับการจัดซื้อจัดจ้าง การบริหารพัสดุ และการบริหารสัญญา เพื่อให้เป็นไปตามพระราชบัญญัติคุ้มครองข้อมูลส่วนบุคคลของประเทศไทย พ.ศ. 2562 (PDPA) ซึ่งมีผลบังคับใช้อย่างครบถ้วน ตั้งแต่วันที่ 1 มิถุนายน 2565 ทั้งนี้ ท่านสามารถศึกษารายละเอียดประกาศความเป็นส่วนตัว (Privacy Notice) สำหรับการจัดซื้อจัดจ้าง การบริหารพัสดุ และการบริหารสัญญา ได้ที่ <https://www.egat.co.th/privacy-notice-procurement.html> หรือที่ QR Code ด้านล่าง



การขิดฆ่าข้อมูลส่วนบุคคลอ่อนไหว

กฟผ. มีประกาศความเป็นส่วนตัว (Privacy Notice) สำหรับการจัดซื้อจัดจ้าง การบริหารพัสดุ และการบริหารสัญญา เพื่อใช้ในการเก็บรวบรวม ใช้ หรือเปิดเผย ข้อมูลส่วนบุคคล แต่ไม่เก็บข้อมูลส่วนบุคคลอ่อนไหว หากเอกสารของท่านที่ต้องส่งมอบให้ กฟผ. มีข้อมูลส่วนบุคคลอ่อนไหวตามที่ถูกบัญญัติไว้ในมาตรา 26 ของ PDPA ดังนี้ เชื้อชาติ เผ่าพันธุ์ ความคิดเห็นทางการเมือง ความเชื่อในลัทธิ ศาสนาหรือปรัชญา พฤติกรรมทางเพศ ประวัติอาชญากรรม ข้อมูลสุขภาพ ความพิการ ข้อมูลสหภาพแรงงาน ข้อมูลพันธุกรรม ข้อมูลชีวภาพ หรือข้อมูลอื่นใด ซึ่งกระทบต่อเจ้าของข้อมูลส่วนบุคคลในทำนองเดียวกันรวมอยู่ด้วย ขอให้ท่านขิดฆ่า หรือปกปิดข้อมูลดังกล่าว ก่อนส่งมอบให้แก่ กฟผ.

Notice to Bidder

Subject : Online Payment for Purchase of Bidding Documents

Please be informed of the online payment for purchase of bidding documents as follows:

- 1) Download the Registration Form and fill out all necessary information by typing. (Complete data is required.)
- 2) Payment shall be made by bank transfer or telegraphic transfer to EGAT's account no. 109-6-01958-2 (swift code : KRTHTHBK), Krung Thai Bank Public Company Limited, Bangkruai Branch, Nonthaburi.

All bank charges and fees incurred by the payment of bidding documents shall be under the buyer's responsibility.

- 3) Submit the fill-out Registration Form and the proof of payment from 1) to the email address of the in-charge officer and procurement.tse@egat.co.th in the CC. before 15.00 hrs. Bangkok Standard Time.
- 4) After the payment has been verified for approximately 3 working days, the in-charge officer will send the link for downloading the bidding documents together with the receipt to the purchaser's email address in the Registration Form.

Registration Form

Invitation to Bid No. TS12-S-26(R)

Supply and Construction of 230/115 kV Ban Bueng 2 Substation (GIS),
Improvement of 115 kV Ban Bueng Substation, and Supply of Control and
Protection Equipment for 230 kV Bo Win Substation
Transmission System Expansion Project No. 12

Available Duration for Purchasing : January 26, 2024 - February 23, 2024

Price of Bidding Documents : USD 500.- or THB 15,000.-

Instructions

- 1) Fill out this Registration Form in English by typing. (Complete data is required.)
- 2) Payment shall be made by bank transfer or telegraphic transfer to EGAT's account no. 109-6-01958-2 (swift code : KRTHTHBK), Krung Thai Bank Public Company Limited, Bangkruai Branch, Nonthaburi.
- 3) Submit the filled-out Registration Form and the proof of payment to the in-charge officer via email thana.kir@egat.co.th (with cc. procurement.tse@egat.co.th) before 15.00 hrs. Bangkok Standard Time.
- 4) The in-charge officer will send the link for downloading the bidding documents together with the receipt to the purchaser's email address in the Registration Form, which will take approximately 3 working days.

For Purchaser			TAX ID :
No.	Receipt No. :	Date :	
Bidder's Name			
Address			
		Country :	
Name of Contact Person :		Tel.	Mobile No.
Email Address :			
Local Representative			
Address			
		Tax ID :	
Name of Contact Person :		Tel.	Mobile No.
Email Address :			
For Procurement Officer		Change of Bidder's Name	TAX ID :
Bidder's Letter No. :			Dated :
New Bidder's Name			
Address			
		Country :	
Name of Contact Person :		Tel.	Mobile No.
Email Address :			
Contact Information of In-charge Officer			
Name	Mr. Thana Kirdboonsong		
Email address	thana.kir@egat.co.th		
Telephone No.	66 2436 3342		
Mobile No.	668 7116 3690		



Invitation to Bid No. TS12-S-26(R)

Supply and Construction of 230/115 kV Ban Bueng 2 Substation (GIS), Improvement of 115 kV Ban Bueng Substation, and Supply of Control and Protection Equipment for 230 kV Bo Win Substation Transmission System Expansion Project No. 12 Two-Envelope (Pre-Qualification)

The Electricity Generating Authority of Thailand (EGAT) is calling for the subject Invitation to Bid to be financed by EGAT's fund. The escalation factor (K) for price adjustment is applied to this Bid.

Place of Construction : Ban Bueng 2 Substation (GIS) and Ban Bueng Substation

Place of Delivery for Supply of Equipment : EGAT's Store at Pluak Daeng

Medium Cost (including Value Added Tax and other expenses) : THB 1,700,000,000.-

Eligibility of Bidders

1. The Bidder and the Equipment shall be named in EGAT Accepted List as specified in the bidding documents.
2. The Bidder shall be a juristic person who provides such services and shall not be named in the List of Work Abandoners published by the Permanent Secretary, Ministry of Finance, and/or in the Debarment List and/or in the List of Work Abandoners declared by EGAT.
3. The Bidder shall not be a Jointly Interested Bidder with other Bidders as from the date of EGAT's issuance of the Invitation, or shall not be a person who undertakes any action as an "Obstruction of Fair Price Competition" for this Invitation.
4. The Bidder shall not either be EGAT's consultant or involve in EGAT's consultancy company under this Invitation to Bid, or shall not have EGAT's personnel involved in his business as shareholder having voting right that can control his business, director, manager, officer, employee, agent, or consultant except those who are officially ordered by EGAT to act or participate therein.
5. The Bidder shall not be the person who is privileged or protected not to be taken any legal proceedings under Thai Court; Provided that such Bidder's government declares that such special privilege is waived.
6. The Bidder who is a joint venture or consortium shall carry out all the work under such formation from the time of bidding until the fulfillment of the Contract.

Availability of Bidding Documents

Bidding Documents will be available for online purchase during 8:00 hrs. to 15:00 hrs., Bangkok Standard Time, as from January 26, 2024 to February 23, 2024 at USD 500.- or THB 15,000.- per copy, non-refundable.

Please find more details for online purchasing process at <http://www4.egat.co.th/fprocurement/biddingeng/> or contact for further information at telephone no. 66 2436 0342 or procurement.tse@egat.co.th.

Delivery of Bids

Price and Technical Proposals shall be submitted at Bidding Room, 1st Floor, Tor 082 Building during 09:30 hrs. to 10:00 hrs., Bangkok Standard Time, March 26, 2024 and Technical Proposal will be opened publicly at 10:00 hrs.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

January 26, 2024

Chattiya C.

(Miss Chattiya Chandhanayingyong)

Chief, International Procurement Department - Transmission Segment



ประกาศการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย
เรื่อง ประกวดราคาจ้าง เลขที่ TS12-S-26(R)
ประกวดราคา 2 ซอง (Pre-Qualification)

การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.) มีความประสงค์จะจัดซื้อและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 230/115 KV บ้านบึง 2 (GIS) จัดซื้อและจ้างก่อสร้างปรับปรุงสถานีไฟฟ้าแรงสูง 115 KV บ้านบึง และจัดซื้ออุปกรณ์ระบบควบคุมและป้องกันสำหรับสถานีไฟฟ้าแรงสูง 230 KV บ่อวิน สำหรับโครงการขยายระบบส่งไฟฟ้าระยะที่ 12 โดยทำสัญญาแบบปรับราคาได้ (ค่า K) โดยใช้งบประมาณ กฟผ.

สถานที่ก่อสร้าง : สถานีไฟฟ้าแรงสูงบ้านบึง 2 (GIS) และสถานีไฟฟ้าแรงสูงบ้านบึง

สถานที่ส่งมอบสำหรับการจัดซื้ออุปกรณ์ : คลังพัสดุ กฟผ. ปลวกแดง

ราคากลาง (รวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ) : 1,700,000,000.- บาท

คุณสมบัติของผู้เสนอราคา

1. ต้องเป็นผู้ประกอบการและพัสดุที่ผ่านการคัดเลือกคุณสมบัติเบื้องต้นตามบัญชีรายชื่อที่ระบุในเอกสารประกวดราคา
2. ต้องเป็นนิติบุคคลผู้มีอาชีพรับจ้างตามประกวดราคาจ้างดังกล่าว และต้องไม่เป็นผู้ทำงานซึ่งปลัดกระทรวงการคลังได้แจ้งเวียนชื่อไว้ หรือต้องไม่เป็นผู้ที่ กฟผ. ห้ามติดต่อหรือห้ามเข้าเสนอราคา หรือต้องไม่เป็นผู้ที่ได้รับผลของการสั่งให้นิติบุคคลหรือบุคคลอื่นเป็นผู้ทำงานตามคำสั่ง กฟผ.
3. ต้องไม่เป็นผู้มีผลประโยชน์ร่วมกันกับผู้เสนอราคารายอื่น ณ วันประกาศประกวดราคาครั้งนี้เป็นต้นไป หรือต้องไม่เป็นผู้กระทำการอันเป็นการขัดขวางการแข่งขันราคาอย่างเป็นธรรมในการดำเนินการประกวดราคาครั้งนี้
4. ต้องไม่เป็นที่ปรึกษาของ กฟผ. หรือมีส่วนร่วมในบริษัทที่ปรึกษาของ กฟผ. ในงานนี้ หรือต้องไม่มีผู้ปฏิบัติงาน กฟผ. เข้าไปมีส่วนร่วมในกิจการของผู้เสนอราคา ไม่ว่าจะในฐานะผู้ถือหุ้นที่มีสิทธิควบคุมการจัดการ กรรมการ ผู้อำนวยการ ผู้จัดการ พนักงาน ลูกจ้าง ตัวแทน หรือที่ปรึกษา ยกเว้น ในกรณีที่มีผู้ปฏิบัติงานได้รับคำสั่งอย่างเป็นทางการจาก กฟผ. ให้ไปปฏิบัติงานหรือเข้าร่วมในกิจการของผู้เสนอราคา
5. ต้องไม่เป็นผู้ได้รับเอกสิทธิ์หรือความคุ้มกัน ซึ่งอาจปฏิเสธไม่ยอมขึ้นศาลไทย เว้นแต่รัฐบาลของผู้เสนอราคาได้มีคำสั่งให้สละสิทธิ์และความคุ้มกันเช่นนั้น
6. ผู้ประสงค์เข้าประกวดราคาในนามของกิจการร่วมค้าหรือกิจการร่วม (Joint Venture or Consortium) จะต้องดำเนินการทุกขั้นตอนของการประกวดราคาในนามของกิจการร่วมค้าหรือกิจการร่วม ตั้งแต่การเสนอราคาจนถึงยื่นซองผูกพันกับ กฟผ.

การขายเอกสารประกวดราคา

ผู้สนใจติดต่อซื้อเอกสารประกวดราคา ในราคาชุดละ 15,000.- บาท ในวันทำการระหว่างเวลา 08:00 น. ถึง 15:00 น. ตั้งแต่วันที่ 26 มกราคม 2567 ถึงวันที่ 23 กุมภาพันธ์ 2567 ทั้งนี้ สามารถดูรายละเอียดการซื้อเอกสารประกวดราคาได้ที่เว็บไซต์ <http://www4.egat.co.th/fprocurement/biddingeng/> หรือสอบถามข้อมูลเพิ่มเติมทางโทรศัพท์ หมายเลข 0 2436 0342 หรืออีเมล procurement.tse@egat.co.th

การยื่นซองประกวดราคา

กำหนดยื่นซองข้อเสนอด้านเทคนิคพร้อมซองราคา ในวันที่ 26 มีนาคม 2567 เวลา 09:30 น. ถึง 10:00 น. และ
เปิดซองข้อเสนอด้านเทคนิคเวลา 10:00 น. ณ ห้องประกวดราคา ชั้น 1 อาคารฝ่ายจัดซื้อจัดจ้างและบริหารพัสดุ ท.082
การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย เชียงสะพานพระราม 7 จังหวัดนนทบุรี

ประกาศ ณ วันที่ 26 มกราคม 2567



(นางสาวฉัตรดิยา จันทนยิ่งยง)

หัวหน้ากองจัดซื้อจัดจ้างต่างประเทศสายงานระบบส่ง

ตารางแสดงวงเงินงบประมาณที่ได้รับจัดสรรและราคากลาง(ราคาอ้างอิง)
ในการจัดซื้อจัดจ้างที่มีใช้งานก่อสร้าง

1. ชื่อโครงการ Bid No. TS12-S-26(R)

การจัดซื้อและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 230/115 kV บ้านบึง 2 (GIS), จัดซื้อและ
จ้างก่อสร้างปรับปรุงสถานีไฟฟ้าแรงสูง 115 kV บ้านบึง และจัดซื้ออุปกรณ์ระบบควบคุมและ
ป้องกันสำหรับสถานีไฟฟ้าแรงสูง 230 kV บ่อวิน

โครงการขยายระบบส่งไฟฟ้าระยะที่ 12

/หน่วยงานเจ้าของโครงการ ฝ่ายแผนงานและโครงการระบบส่ง การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย

2. วงเงินงบประมาณที่ได้รับจัดสรร

โครงการขยายระบบส่งไฟฟ้าระยะที่ 12 งบประมาณ 60,000 ล้านบาท

3. วันที่กำหนดราคากลาง 1 ธันวาคม 2566 (วันที่ ชสพ. ทำการแทน รวส. อนุมัติ)

ราคารวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ เป็นเงิน 1,700,000,000.00 บาท ราคา/หน่วย ตามเอกสารแนบ

4. แหล่งที่มาของราคากลาง

หลักเกณฑ์การกำหนดราคากลางการจัดซื้อและจัดจ้างงานก่อสร้างระบบส่งไฟฟ้าของสายงานระบบส่ง

5. รายชื่อเจ้าหน้าที่ผู้กำหนดราคากลาง

- | | |
|----------------------------------|---------------|
| 5.1 นายฉัตรชัย เขาวนาธิคม | หมฟ-ส. กวอ-ส. |
| 5.2 นายธิตวิวัฒน์ เบญจวงค์รัตน์ | หสก-ส. กวอ-ส. |
| 5.3 นายภาณุวัฒน์ ลิขิตผลผดุง | หอต-ส. กวอ-ส. |
| 5.4 นางสาวจารุวรรณ พิพัฒน์มงคลพร | หวอ-ส. กวอ-ส. |
| 5.5 นายรุทหาญ รุจิธัญธาร | กวป-ส. |
| 5.6 นายศุภกฤษ สุจารีรัตน์พงษ์ | กวธ-ส. |
| 5.7 นางสาวเอกอุหาร เทวารุทธ | กวส-ส. อรส. |

หมายเหตุ ค่าใช้จ่ายอื่นๆ ได้แก่ ค่าใช้จ่ายที่ กฟผ. ต้องจ่ายตามวิธีการพิจารณาเปรียบเทียบราคาที่กำหนดไว้
ในเอกสารประกวดราคา เช่น อกรขาเข้า เป็นต้น

นางสาวเบญญาลักษณ์ ศรีลัมพ์

หจตส-ท.

26 ม.ค. 67

MEDIUM COST FOR BID NO. TS12-S-26(R)

SUMMARY OF BID PRICE

SUPPLY AND CONSTRUCTION OF 230/115 KV BAN BUENG 2 SUBSTATION (GIS), IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION, AND SUPPLY OF CONTROL AND PROTECTION EQUIPMENT FOR 230 KV BO WIN SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Schedule	Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht	Local Transportation (excluding VAT) Baht	Local Transportation, Construction and Installation (excluding VAT) Baht
			Foreign Supply	Local Supply			
			CIF Thai Port	Ex-works Price (excluding VAT) Baht			
			Amount	Amount			
1	230 KV BAN BUENG 2 SUBSTATION (GIS)	THB	366,595,979.44				
				143,667,742.89	197,364,218.67	123,803.55	59,459,571.34
2	115 KV BAN BUENG 2 SUBSTATION (GIS)	THB	349,468,671.13				
				141,594,641.76	72,596,901.19	80,271.81	57,521,294.96
3	115 KV BAN BUENG SUBSTATION	THB	4,875,437.54				
				120,211,648.47	43,457,302.13	80,417.00	16,294,246.28
4	230 KV BO WIN SUBSTATION						
				3,014,163.00		17,613.00	
BID PRICE		THB	720,940,088.11	Baht 408,488,196.12	Baht 313,418,421.99	Baht 302,105.36	Baht 133,275,112.58
OTHER EXPENSES		THB	14,418,801.76				
VAT			51,475,122.29	Baht 28,594,173.73	Baht 21,939,289.54	Baht 21,147.38	Baht 9,329,257.88
SUMMARY OF BID PRICE		THB	786,834,012.16	Baht 437,082,369.85	Baht 335,357,711.53	Baht 323,252.74	Baht 142,604,370.46
TOTAL MEDIUM COST		THB	1,702,201,716.74				
TOTAL MEDIUM COST (ROUND)		THB	1,700,000,000.00				

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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
SCHEDULE 1 : 230 KV BAN BUENG 2 SUBSTATION (GIS)
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht Amount	Local Transportation (excluding VAT) Baht Amount	Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht			
		Amount	Amount			
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	365,311,816.54	131,119,724.89			59,459,571.34
PART 1C : CIVIL WORK				197,364,218.67		
PART 1D : SUPPLY OF SPARE PARTS	THB	1,284,162.90	12,548,018.00		123,803.55	
TOTAL PRICE	THB	366,595,979.44	Baht	Baht	Baht	Baht
			143,667,742.89	197,364,218.67	123,803.55	59,459,571.34

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26 ม.ค. 67


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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB1 : Power Transformer and Marshalling Control Cubicle	THB		390,000.00	39,000.00
Schedule 1AB2 : Distribution Transformer	THB		2,524,000.00	252,400.00
Schedule 1AB4 : Surge Arrester	THB	450,000.00	198,000.00	64,800.00
Schedule 1AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box	THB	630,000.00	50,000.00	68,000.00
Schedule 1AB7 : SF6 Gas Insulated Switchgear	THB	360,614,976.00		36,061,497.60

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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB11 : Power Fuse, Fuse Link and Hook Stick	THB	1,118,713.20		111,871.32
Schedule 1AB12 : AC&DC Distribution Board and Termination Box			3,830,871.00	383,087.10
Schedule 1AB13 : Stationary Battery and Battery Charger	THB	821,590.66	785,400.00	160,699.07
Schedule 1AB14 : Substation Steel Structure			7,042,634.36	1,760,658.59


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Dr. G. G.
 นายประวิทย์ เลิศโกวิท
 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB15 : Insulator				57,278.10
Schedule 1AB16 : Cable Terminations	THB	286,030.80		71,507.70
Schedule 1AB17 : XLPE Power Cable			326,700.00	81,675.00
Schedule 1AB18 : Low Voltage Cable and Conductor			13,830,399.00	3,457,599.75


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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB19 : Switchyard Lighting Fixtures			1,224,183.40	306,045.85
Schedule 1AB20 : Aluminum Tube, Connector and Miscellaneous Hardware			189,055.30	47,263.83
Schedule 1AB21 : Bus Fitting	THB	630,389.88		157,597.47
Schedule 1AB22 : Grounding Material	THB	481,072.70	472,772.33	238,461.26


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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB23 : Substation Miscellaneous	THB	91,743.30	1,047,055.50	284,699.70
Schedule 1AB24 : Control and Protection System			91,660,745.00	11,766,390.00
Schedule 1AB25 : Fault Recording System			3,177,296.00	336,491.00
Schedule 1AB33 : CCTV			3,436,913.00	293,648.00


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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Panel	THB	187,300.00	651,900.00	81,900.00
Schedule 1AB35 : Communication Cable			281,800.00	315,000.00
Schedule 1AB39 : Commissioning				3,062,000.00
PART 1AB	THB	365,311,816.54	Baht	Baht
			131,119,724.89	59,459,571.34

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 01 Dec 2023


MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 1C : CIVIL WORK
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Local Currency (excluding VAT) Baht
	Amount
Schedule 1C1 : Foundation Work	11,085,471.10
Schedule 1C2 : Cable Trench	5,281,595.77
Schedule 1C3 : Building	111,670,706.23
Schedule 1C4 : Earth Work, Road and Crushed Rock Surfacing	8,803,106.40
Schedule 1C5 : Water Supply System	381,746.20
Schedule 1C6 : Drainage System	13,219,629.28
Schedule 1C7 : Special Construction Works	3,111,349.90
Schedule 1C8 : Miscellaneous	1,918,059.99
Schedule 1C9 : Fire Protection System	41,892,553.80
PART 1C	Baht 197,364,218.67

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 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 1D : SUPPLY OF SPARE PARTS
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1D7 : Spare Parts for SF6 Gas Insulated Switchgear	THB	682,561.00		34,128.05
Schedule 1D11 : Spare Parts for Power Fuse, Fuse Link and Hook Stick	THB	125,286.70		6,264.34
Schedule 1D12 : Spare Parts for AC&DC Distribution Board and Termination Box			96,168.00	4,808.40
Schedule 1D22 : Spare Parts for Grounding Material	THB	476,315.20		23,815.76

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01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 1D : SUPPLY OF SPARE PARTS
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1D24 : Spare Parts for Control and Protection System			11,604,294.00	43,771.00
Schedule 1D25 : Spare Parts for Fault Recording System			847,556.00	11,016.00
PART 1D	THB	1,284,162.90	Baht	Baht
			12,548,018.00	123,803.55


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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
SCHEDULE 2 : 115 KV BAN BUENG 2 SUBSTATION (GIS)
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht Amount	Local Transportation (excluding VAT) Baht Amount	Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht			
		Amount	Amount			
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	347,863,234.93	141,594,641.76			57,521,294.96
PART 2C : CIVIL WORK				72,596,901.19		
PART 2D : SUPPLY OF SPARE PARTS	THB	1,605,436.20			80,271.81	
TOTAL PRICE	THB	349,468,671.13	Baht	Baht	Baht	Baht
			141,594,641.76	72,596,901.19	80,271.81	57,521,294.96

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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 2AB4 : Surge Arrester	THB	2,079,000.00	648,000.00	272,700.00
Schedule 2AB7 : SF6 Gas Insulated Switchgear	THB	344,277,324.00		34,427,732.40
Schedule 2AB10 : Disconnecting Switch	THB	864,292.00	165,434.00	102,972.60
Schedule 2AB12 : AC&DC Distribution Board and Termination Box			487,634.00	48,763.40

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26 ม.ค. 67

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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 2AB14 : Substation Steel Structure			4,106,099.64	1,026,524.91
Schedule 2AB15 : Insulator				68,396.63
Schedule 2AB18 : Low Voltage Cable and Conductor			7,864,862.50	1,966,215.63
Schedule 2AB19 : Switchyard Lighting Fixtures			934,852.60	233,713.15

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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 2AB20 : Aluminum Tube, Connector and Miscellaneous Hardware			421,554.25	105,388.56
Schedule 2AB21 : Bus Fitting	THB	450,240.65		112,560.16
Schedule 2AB22 : Grounding Material	THB	116,804.98	347,683.77	116,122.19
Schedule 2AB23 : Substation Miscellaneous	THB	75,573.30	930,600.00	251,543.33

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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 2AB24 : Control and Protection System			121,510,691.00	15,680,132.00
Schedule 2AB25 : Fault Recording System			4,177,230.00	439,530.00
Schedule 2AB39 : Commissioning				2,669,000.00
PART 2AB	THB	347,863,234.93	Baht	Baht
			141,594,641.76	57,521,294.96

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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 2C : CIVIL WORK
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Local Currency (excluding VAT) Baht
	Amount
Schedule 2C1 : Foundation Work	4,559,041.34
Schedule 2C2 : Cable Trench	2,584,048.50
Schedule 2C3 : Building	41,875,116.54
Schedule 2C4 : Earth Work, Road and Crushed Rock Surfacing	6,295,960.00
Schedule 2C6 : Drainage System	8,650,243.25
Schedule 2C7 : Special Construction Works	1,492,521.22
Schedule 2C8 : Miscellaneous	4,601,970.34
Schedule 2C9 : Fire Protection System	2,538,000.00
PART 2C	Baht 72,596,901.19

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[Signature]
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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
PART 2D : SUPPLY OF SPARE PARTS
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 2D7 : Spare Parts for SF6 Gas Insulated Switchgear	THB	1,129,121.00		56,456.05
Schedule 2D22 : Spare Parts for Grounding Material	THB	476,315.20		23,815.76
PART 2D	THB	1,605,436.20	Baht	Baht 80,271.81

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นายประวิทย์ เลิศโกวิท

นายประวิทย์ เลิศโกวิท

ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
01 Dec 2023

INVITATION TO BID NO. TS12-S-26(R)
SCHEDULE 3 : 115 KV BAN BUENG SUBSTATION
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht Amount	Local Transportation (excluding VAT) Baht Amount	Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht			
		Amount	Amount			
PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	4,273,835.64	109,663,020.47			16,294,246.28
PART 3C : CIVIL WORK				43,457,302.13		
PART 3D : SUPPLY OF SPARE PARTS	THB	601,601.90	10,548,628.00		80,417.00	
TOTAL PRICE	THB	4,875,437.54	Baht	Baht	Baht	Baht
			120,211,648.47	43,457,302.13	80,417.00	16,294,246.28

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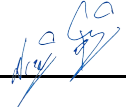

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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
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INVITATION TO BID NO. TS12-S-26(R)
PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 3AB2 : Distribution Transformer	THB		1,646,000.00	197,520.00
Schedule 3AB5 : Current Transformer and Junction Box	THB	1,710,000.00	576,000.00	274,320.00
Schedule 3AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box	THB		136,000.00	16,320.00
Schedule 3AB11 : Power Fuse, Fuse Link and Hook Stick	THB	1,118,713.20		134,245.58


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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
01 Dec 2023

INVITATION TO BID NO. TS12-S-26(R)
PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 3AB12 : AC&DC Distribution Board and Termination Box			1,598,547.00	191,825.64
Schedule 3AB13 : Stationary Battery and Battery Charger	THB	821,590.66	392,700.00	145,714.88
Schedule 3AB14 : Substation Steel Structure			92,170.59	27,651.18
Schedule 3AB18 : Low Voltage Cable and Conductor			7,943,105.50	2,382,931.65

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PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 3AB19 : Switchyard Lighting Fixtures			675,958.80	202,787.64
Schedule 3AB20 : Aluminum Tube, Connector and Miscellaneous Hardware			38,043.50	11,413.05
Schedule 3AB21 : Bus Fitting	THB	111,207.72		33,362.32
Schedule 3AB22 : Grounding Material	THB	196,042.30	207,715.68	121,127.39


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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
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INVITATION TO BID NO. TS12-S-26(R)
PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 3AB23 : Substation Miscellaneous	THB	179,081.76	228,032.40	122,134.25
Schedule 3AB24 : Control and Protection System			92,211,451.00	11,037,090.00
Schedule 3AB25 : Fault Recording System			3,177,296.00	337,055.00
Schedule 3AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power Panel	THB	137,200.00	541,700.00	66,200.00

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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
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INVITATION TO BID NO. TS12-S-26(R)
PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 3AB35 : Communication Cable			198,300.00	168,000.00
Schedule 3AB39 : Commissioning				243,000.00
Schedule 3AB40 : Installation of Equipment and Steel Structure Supplied by EGAT				581,547.70
PART 3AB	THB	4,273,835.64	Baht	Baht
			109,663,020.47	16,294,246.28


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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

INVITATION TO BID NO. TS12-S-26(R)
PART 3C : CIVIL WORK
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Description	Local Currency (excluding VAT) Baht
	Amount
Schedule 3C1 : Foundation Work	1,107,011.40
Schedule 3C2 : Cable Trench	582,424.48
Schedule 3C3 : Building	23,707,125.86
Schedule 3C4 : Earth Work, Road and Crushed Rock Surfacing	1,654,597.78
Schedule 3C5 : Water Supply System	54,593.00
Schedule 3C6 : Drainage System	8,360,530.86
Schedule 3C7 : Special Construction Works	890,103.65
Schedule 3C8 : Miscellaneous	1,145,046.10
Schedule 3C9 : Fire Protection System	5,955,869.00
PART 3C	Baht 43,457,302.13



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INVITATION TO BID NO. TS12-S-26(R)
PART 3D : SUPPLY OF SPARE PARTS
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Description	Currency	Supply of Equipment		Local Transportation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 3D11 : Spare Parts for Power Fuse, Fuse Link and Hook Stick	THB	125,286.70		6,264.34
Schedule 3D12 : Spare Parts for AC&DC Distribution Board and Termination Box			28,638.00	1,431.90
Schedule 3D22 : Spare Parts for Grounding Material	THB	476,315.20		23,815.76
Schedule 3D24 : Spare Parts for Control and Protection System			9,672,434.00	37,889.00



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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
01 Dec 2023

INVITATION TO BID NO. TS12-S-26(R)
PART 3D : SUPPLY OF SPARE PARTS
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 3D25 : Spare Parts for Fault Recording System			847,556.00	11,016.00
PART 3D	THB	601,601.90	Baht 10,548,628.00	Baht 80,417.00


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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
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INVITATION TO BID NO. TS12-S-26(R)
SCHEDULE 4 : 230 KV BO WIN SUBSTATION
SUPPLY OF CONTROL AND PROTECTION EQUIPMENT FOR 230 KV BO WIN SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht Amount	Local Transportation (excluding VAT) Baht Amount	Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht			
		Amount	Amount			
PART 4E : WORK ON SUPPLY EQUIPMENT BASIS			3,014,163.00		17,613.00	
TOTAL PRICE			Baht 3,014,163.00	Baht	Baht 17,613.00	Baht



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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
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INVITATION TO BID NO. TS12-S-26(R)
PART 4E : WORK ON SUPPLY EQUIPMENT BASIS
SUPPLY OF CONTROL AND PROTECTION EQUIPMENT FOR 230 KV BO WIN SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Description	Currency	Supply of Equipment		Local Transportation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 4E24 : Control and Protection System			3,014,163.00	17,613.00
PART 4E			Baht 3,014,163.00	Baht 17,613.00



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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB1 : Power Transformer and Marshalling Control Cubicle
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB1-1	Marshalling Control Cubicle as per EGATs Dwg No. TP-E-10.5, TP-E-10.6 and TP-E-10.8	3		THB			130,000.00	390,000.00	XXXXX	XXXXX		
1AB1-2	Cost of Local Transportation Construction and Installation for Item No 1AB1-1	Lumpsum	Lumpsum	THB	XXXXX	XXXXX	XXXXX	XXXXX	39,000.00	39,000.00		
Total Price for Schedule 1AB1				THB			Baht		Baht			
							390,000.00		39,000.00			



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB2 : Distribution Transformer
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB2-1	500 kVA, 22000-400/230V distribution transformer; oil immersed, outdoor type as per Ratings and Features RF DX2702	2		THB			1,055,000.00	2,110,000.00	XXXXXX	XXXXXX		
1AB2-2	100 kVA, 400-400/230V distribution transformer; oil immersed, outdoor type as per Ratings and Features RF DX0306	1		THB			414,000.00	414,000.00	XXXXXX	XXXXXX		
1AB2-3	Cost of Local Transportation Construction and Installation for Item No 1AB2-1 thru 1AB2-2			THB	XXXXXX	XXXXXX	XXXXXX	XXXXXX	252,400.00	252,400.00		
		Lumpsum	Lumpsum									
Total Price for Schedule 1AB2				THB			Baht		Baht			
							2,524,000.00		252,400.00			



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB4 : Surge Arrester
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB4-1	192 kV Surge Arrester as per Ratings and Features RF SA8Y11	6		THB	75,000.00	450,000.00			XXXXX	XXXXX		
1AB4-2	Steel Supporting Structure for SA8Y11(for Item No. 1AB4-1), H=5.50 m as per Dwg. No. ST-LA-8-01 and SD-AB-0-01	6		THB			33,000.00	198,000.00	XXXXX	XXXXX		
1AB4-3	Cost of Local Transportation Construction and Installation for Item No 1AB4-1 thru 1AB4-2	Lumpsum	Lumpsum	THB	XXXXXX	XXXXXX	XXXXXX	XXXXXX	64,800.00	64,800.00		
Total Price for Schedule 1AB4				THB	450,000.00		Baht	198,000.00		Baht	64,800.00	


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB6-1	22 kV VT, 150 kV BIL, 22000/√3 : 110/√3&110/√3 V oil filled as per Ratings and Features RF VT2012	6		THB	105,000.00	630,000.00			XXXXX	XXXXX		
1AB6-2	Junction Box type PT6 (for Item 1AB6-1) as per Dwg. No. TP-E-18.1-2/4, 3/4 and TP-E-18.4	2		THB			25,000.00	50,000.00	XXXXX	XXXXX		
1AB6-3	Cost of Local Transportation Construction and Installation for Item No 1AB6-1 thru 1AB6-2	Lumpsum	Lumpsum	THB	XXXXXX	XXXXXX	XXXXXX	XXXXXX	68,000.00	68,000.00		
Total Price for Schedule 1AB6				THB	630,000.00		Baht 50,000.00		Baht 68,000.00			


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB7 : SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB7-1	245 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS8450(IEC) and Drawing No. BBG2-S-1-01/04, BBG2-S-1-02/04 and BBG2-S-2-01/01 (Future line & Line no.2 to Bo Win)	1		THB	90,153,744.00	90,153,744.00			XXXXX	XXXXX		
1AB7-2	245 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS8450(IEC) and Drawing No. BBG2-S-1-01/04, BBG2-S-1-02/04 and BBG2-S-2-01/01 (Line no.1 to Bo Win & KT1A)	1		THB	90,153,744.00	90,153,744.00			XXXXX	XXXXX		
1AB7-3	245 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS8450(IEC) and Drawing No. BBG2-S-1-01/04, BBG2-S-1-02/04 and BBG2-S-2-01/01 (KT2A & Future line)	1		THB	90,153,744.00	90,153,744.00			XXXXX	XXXXX		
1AB7-4	245 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS8450(IEC) and Drawing No. BBG2-S-1-01/04, BBG2-S-1-02/04 and BBG2-S-2-01/01 (Future line & KT3A)	1		THB	90,153,744.00	90,153,744.00			XXXXX	XXXXX		



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB7 : SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB7-5	245 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS8450(IEC) and Drawing No. BBG2-S-1-01/04, BBG2-S-1-02/04 and BBG2-S-2-01/01 (Metal Enclosed Bus) including VTs and fast acting earthing switches at main bus	1	lot	THB	included	included			XXXXX	XXXXX		
1AB7-6	245 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS8450(IEC) outdoor type (GIB) as per Drawing No. BBG2-S-1-01/04, BBG2-S-1-02/04 and BBG2-S-2-01/01	1	lot	THB	included	included			XXXXX	XXXXX		
1AB7-7	Local control cubicle for IS8450 for item 1AB7-1 thru 1AB7-6*	12	set	THB	included	included			XXXXX	XXXXX		
1AB7-8	Steel Supporting Structure for IS8450*	1	lot	THB	included	included			XXXXX	XXXXX		
1AB7-9	Removable service platform and removable ladder for GIS inspection	1	lot	THB	included	included			XXXXX	XXXXX		



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB7 : SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB7-10	Cost of Local Transportation Construction and Installation for Item No 1AB7-1 thru 1AB7-9	Lump sum	Lump sum	THB	XXXXXX	XXXXXX	XXXXXX	XXXXXX	36,061,497.60	36,061,497.60		
	Note : The SF6 gas in a quantity equivalent to 15% of the total equipment actual requirement shall be provided as follows: - 100% of SF6 gas quantity shall be shipped in returnable steel bottles which shall be returned back to Contractor - 15% of SF6 gas quantity shall be shipped in non returnable steel bottles which shall become the property of EGAT.											
Total Price for Schedule 1AB7				THB	360,614,976.00		Baht		Baht 36,061,497.60			

* The design of supporting structures and LCCs for Gas Insulated Switchgear shall be verified by Gas Insulated Switchgear manufacturer


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB11 : Power Fuse, Fuse Link and Hook Stick
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB11-1	22 kV 100 A 12.5 kA 1-pole dropout fuse as per Ratings and Features RF PF2111 (Not including fuse link or refill unit)	6		THB	170,974.10	1,025,844.60			XXXXX	XXXXX		
1AB11-2	Fuse link or refill unit 20E for 22 kV power fuse (Standard Speed)	6		THB	15,478.10	92,868.60			XXXXX	XXXXX		
1AB11-3	Cost of Local Transportation Construction and Installation for Item No 1AB11-1 thru 1AB11-2											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	111,871.32	111,871.32		
Total Price for Schedule 1AB11				THB	1,118,713.20		Baht		Baht 111,871.32			

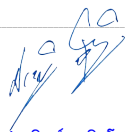
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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB12 : AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB12-1	400/230 Vac Load Center Unit Substation(LCUS) as per Dwg. No. TP-418, TYP1-L-5-01-01 and Rating and Features RF No. LVCB (Design by Contractor)	1						850,440.00	850,440.00	XXXXX	XXXXX	
1AB12-2	Lighting Relay Panel(LRP) as per Dwg. No. LT-RP-0-03	1						92,148.00	92,148.00	XXXXX	XXXXX	
1AB12-3	Safety switch 600 Vac 800 A, 4 wire, solid neutral (S/N), 3 blades, 3 fuses time lag type, outdoor NEMA 4X enclosure or higher, completed with 800 A fuses. The terminal lug shall be suitable for - incoming cable size of 6x240 sq.mm phase wire and 2x240 sq.mm neutral wire. - outgoing cable size of 6x240 sq.mm phase wire and 2x240 sq.mm neutral wire.	2						201,593.00	403,186.00	XXXXX	XXXXX	
1AB12-4	Termination Box type TBl as per Dwg No. LT-TB-0-01	12						3,236.00	38,832.00	XXXXX	XXXXX	
1AB12-5	Outdoor Receptacle Box type ORBl as per Dwg. No. SE-ORB-0-01	1						22,965.00	22,965.00	XXXXX	XXXXX	
1AB12-6	Outdoor Receptacle Box type ORB as per Dwg. No. SE-ORB-0-01	1						42,109.00	42,109.00	XXXXX	XXXXX	


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB12 : AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB12-7	22kV 100A 12.5kA Load break switch with Cable Termination as per Ratings and Features RF LB2110 with cable termination suitable for - incoming cable size of 3x35 sq.mm, 22 kV XLPE Cable, 1 hole NEMA Pad - outgoing cable size of 3x35 sq.mm, 22 kV XLPE Cable, 1 hole NEMA Pad	2					589,828.00	1,179,656.00	XXXXX	XXXXX		
1AB12-8	Power Box No. 1 (PRB-1) as per Dwg. No. LT-EQ-0-01	1					60,815.00	60,815.00	XXXXX	XXXXX		
1AB12-9	400/230 Vac Distribution Board as per Dwg No. TP-E-4.4 (For Control Room, designed by Contractor)	1					195,405.00	195,405.00	XXXXX	XXXXX		
1AB12-10	400/230 Vac Distribution Board as per Dwg No. TP-E-4.4 (For 230 kV BBG2 GIS, designed by Contractor)	1					195,405.00	195,405.00	XXXXX	XXXXX		
1AB12-11	125 Vdc Power Panel as per Dwg. No. TP-E-4.4	1					156,690.00	156,690.00	XXXXX	XXXXX		
1AB12-12	125 Vdc Distribution Board as per Dwg No. TP-E-4.4 (For Control Room, designed by Contractor)	2					148,305.00	296,610.00	XXXXX	XXXXX		

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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB12 : AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB12-13	125 Vdc Distribution Board as per Dwg No. TP-E-4.4 (For 230 kV BBG2 GIS, designed by Contractor)	2					148,305.00	296,610.00	XXXXXX	XXXXXX		
1AB12-14	Cost of Local Transportation Construction and Installation for Item No 1AB12-1 thru 1AB12-13											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	383,087.10	383,087.10		
Total Price for Schedule 1AB12							Baht 3,830,871.00		Baht 383,087.10			


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB13 : Stationary Battery and Battery Charger
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB13-1	Vented stationary battery 58 cells (tubular type) for 125 Vdc system complete with electrolyte and battery rack as per Specification attached(Designed by Contractor)											
1AB13-1a	a) Battery	1	set	THB	745,800.00	745,800.00			XXXXX	XXXXX		
1AB13-1b	b) Electrolyte	1	set	THB	24,115.21	24,115.21			XXXXX	XXXXX		
1AB13-1c	c) Battery Rack	1	set	THB	51,675.45	51,675.45			XXXXX	XXXXX		
1AB13-2	125 Vdc battery charger having sufficient rated DC output current, but not less than 15 % of associated battery 8 hour drainage rate, complete with all accessories as per Specification attached and shall be suitable for use with substation battery Item No 1AB13-1	2					392,700.00	785,400.00	XXXXX	XXXXX		
1AB13-3	Cost of Local Transportation Construction and Installation for Item No 1AB13-1 thru 1AB13-2											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	160,699.07	160,699.07		
Total Price for Schedule 1AB13												
				THB	821,590.66		Baht		Baht			
							785,400.00		160,699.07			


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB14 : Substation Steel Structure
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB14-1	230 kV take-off structure (TS801) as per Dwg. No. ST-TS-8-01	6					363,673.08	2,182,038.48	XXXXX	XXXXX		
1AB14-2	230 kV take-off structure (TS802) as per Dwg. No. ST-TS-8-02	6					454,841.81	2,729,050.86	XXXXX	XXXXX		
1AB14-3	230 kV beam (BB801) as per Dwg. No. ST-BB-8-01	3					157,291.11	471,873.33	XXXXX	XXXXX		
1AB14-4	230 kV beam (BB802) as per Dwg. No. ST-BB-8-02	4					175,725.23	702,900.92	XXXXX	XXXXX		
1AB14-5	230 kV bus pole structure (BP803) as per Dwg. No. ST-BP-8-01	9					24,044.50	216,400.50	XXXXX	XXXXX		
1AB14-6	22 kV bus support structure (BS203) as per Dwg. No. ST-BS-2-03, Modify for VT and PT6 installation (Design by contractor)	2					84,656.68	169,313.36	XXXXX	XXXXX		
1AB14-7	Telecommunication Tower Type WSA(H = 30.00 m) as per Dwg. No. UWC-06-WSA-501, 502, 503 & 504	1					520,964.19	520,964.19	XXXXX	XXXXX		
1AB14-8	Junction box support structure (JB001) as per Dwg. No. ST-JB-0-01	3					11,020.40	33,061.20	XXXXX	XXXXX		



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB14 : Substation Steel Structure
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB14-9	Junction box support structure(JB003) as per Dwg. No. ST-JB-0-03	2					8,515.76	17,031.52	XXXXX	XXXXX		
1AB14-10	Cost of Local Transportation Construction and Installation for Item No 1AB14-1 thru 1AB14-9											
		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,760,658.59	1,760,658.59		
Total Price for Schedule 1AB14							Baht 7,042,634.36		Baht 1,760,658.59			



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB15 : Insulator
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB15-1	Suspension insulator ANSI52-3 as per Specification attached	Lump sum	Lump sum		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX		
1AB15-2	230 kV station post insulator ANSI TR No. 308 as per Specification attached	Lump sum	Lump sum		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX		
1AB15-3	22 kV station post insulator ANSI TR No. 208 as per Specification attached	Lump sum	Lump sum		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX		
1AB15-4	Cost of Local Transportation Construction and Installation for Item No 1AB15-1 thru 1AB15-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	57,278.10	57,278.10		
Total Price for Schedule 1AB15									Baht		57,278.10	


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB16 : Cable Terminations
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB16-1	22 kV cable terminations for 1/C no. 35 sq.mm. XLPE power cable as per Ratings and Features RF TN212H	6		THB	6,614.30	39,685.80			XXXXX	XXXXX		
1AB16-2	Cable Cleats with necessary miscellaneous hardware for item no. 1AB17-1 , TREFOIL formation 3-phase set (design by contractor) as per RF no. TNAC1	Lump sum	Lump sum	THB	242,220.00	242,220.00			XXXXX	XXXXX		
1AB16-3	Cable Cleats with necessary miscellaneous hardware for item no. 1AB17-1 , FLAT formation 1-phase set (design by contractor) as per RF no. TNAC1	Lump sum	Lump sum	THB	4,125.00	4,125.00			XXXXX	XXXXX		
1AB16-4	Cost of Local Transportation, Construction and Installation for Item No 1AB16-1 thru 1AB16-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	71,507.70	71,507.70		
Total Price for Schedule 1AB16				THB	286,030.80		Baht		Baht 71,507.70			


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB17 : XLPE Power Cable
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB17-1	22 kV 1/C no. 35 sq.mm. XLPE power cable as per Ratings and Features RF PC2110	Lump sum	Lump sum					326,700.00	326,700.00	XXXXX	XXXXX	
1AB17-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB17-1	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	81,675.00	81,675.00	
Total Price for Schedule 1AB17								Baht 326,700.00		Baht 81,675.00		


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB18 : Low Voltage Cable and Conductor
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum				3,851,947.00	3,851,947.00	XXXXXX	XXXXXX		
1AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum				3,448,060.00	3,448,060.00	XXXXXX	XXXXXX		
1AB18-3	750 V lighting cable (THW) as per Specification attached	Lump sum	Lump sum				132,000.00	132,000.00	XXXXXX	XXXXXX		
1AB18-4	750 V lighting cable (NYY) as per Specification attached	Lump sum	Lump sum				324,940.00	324,940.00	XXXXXX	XXXXXX		
1AB18-5	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				5,627,160.00	5,627,160.00	XXXXXX	XXXXXX		
1AB18-6	Overhead ground wire as per Specification attached	Lump sum	Lump sum				13,640.00	13,640.00	XXXXXX	XXXXXX		
1AB18-7	Aluminum conductor as per Specification attached	Lump sum	Lump sum				432,652.00	432,652.00	XXXXXX	XXXXXX		
1AB18-8	Cost of Local Transportation, Construction and Installation for Item No. 1AB18-1 thru 1AB18-7	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	3,457,599.75	3,457,599.75		
Total Price for Schedule 1AB18							Baht 13,830,399.00		Baht 3,457,599.75			

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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB19 : Switchyard Lighting Fixtures
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB19-1	Flood lighting fixture LED lamp, 10000 lumen, wide-beam, complete with control gear as per Specification attached	22						13,505.80	297,127.60	XXXXX	XXXXX	
1AB19-2	Street lighting fixture LED lamp, 5000 lumen, wide beam, complete with control gear as per Specification attached	27						13,505.80	364,656.60	XXXXX	XXXXX	
1AB19-3	Tapered galvanized steel lamp post H=5000 mm. complete with 2 A 250 V plug fuse, 20 A 500 V terminal block for accepting 4 sq.mm. of incoming and outgoing cables and anchor bolts as per Dwg No. ST-LP-0-03 and SD-AB-0-01	27						20,829.60	562,399.20	XXXXX	XXXXX	
1AB19-4	Cost of Local Transportation Construction and Installation for Item No 1AB19-1 thru 1AB19-3							XXXXX	XXXXX	XXXXX	XXXXX	
		Lump sum	Lump sum					XXXXX	XXXXX	306,045.85	306,045.85	
Total Price for Schedule 1AB19										Baht	Baht	
										1,224,183.40	306,045.85	

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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB20 : Aluminum Tube, Connector and Miscellaneous Hardware
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB20-1	Aluminum tube as per Specification attached	Lump sum	Lump sum				68,326.50	68,326.50	XXXXX	XXXXX		
1AB20-2	230 kV and below Compression connector as per Specification attached	Lump sum	Lump sum				61,308.50	61,308.50	XXXXX	XXXXX		
1AB20-3	230 kV and below Miscellaneous hardware as per Specification attached	Lump sum	Lump sum				59,420.30	59,420.30	XXXXX	XXXXX		
1AB20-4	Cost of Local Transportation Construction and Installation for Item No 1AB20-1 thru 1AB20-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	47,263.83	47,263.83		
Total Price for Schedule 1AB20								Baht	189,055.30	Baht	47,263.83	


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB21 : Bus Fitting
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB21-1	230 kV and below Bus fitting as per Specification attached	Lump sum	Lump sum	THB	630,389.88	630,389.88			XXXXX	XXXXX		
1AB21-2	Cost of Local Transportation Construction and Installation for Item No 1AB21-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	157,597.47	157,597.47		
Total Price for Schedule 1AB21				THB	630,389.88		Baht		Baht 157,597.47			


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB22 : Grounding Material
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	120,975.60	120,975.60			XXXXX	XXXXX		
1AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				472,772.33	472,772.33	XXXXX	XXXXX		
1AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	360,097.10	360,097.10			XXXXX	XXXXX		
1AB22-4	Cost of Local Transportation Construction and Installation for Item No 1AB22-1 thru 1AB22-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	238,461.26	238,461.26		
Total Price for Schedule 1AB22				THB	481,072.70		Baht		Baht			
							472,772.33		238,461.26			

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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB23 : Substation Miscellaneous
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB23-1	Rigid steel conduit as per Specification attached	Lump sum	Lump sum				65,455.50	65,455.50	XXXXX	XXXXX		
1AB23-2	Fitting for rigid steel conduit as per Specification attached	Lump sum	Lump sum	THB	16,170.00	16,170.00			XXXXX	XXXXX		
1AB23-3	HDPE conduit and fitting as per Specification attached	Lump sum	Lump sum				51,000.00	51,000.00	XXXXX	XXXXX		
1AB23-4	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum				930,600.00	930,600.00	XXXXX	XXXXX		
1AB23-5	Heat shrinkable insulation material	Lump sum	Lump sum	THB	75,573.30	75,573.30			XXXXX	XXXXX		
1AB23-6	Cost of Local Transportation Construction and Installation for Item No 1AB23-1 thru 1AB23-5	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	284,699.70	284,699.70		
Total Price for Schedule 1AB23				THB	91,743.30		Baht	1,047,055.50		Baht	284,699.70	


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
1AB24-1	DSS : Digital Substation System including System Integrator	-See Bill of Materials Item No. 1AB24-1 -See Scope of Work -Specification No. 1008 -Drawing Nos. BBG2-E-1 and TP-E-20.3	1	SET					91,660,745.00	91,660,745.00	XXXXX	XXXXX	
1AB24-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB24-1		Lump sum	Lump sum			XXXXX	XXXXX	XXXXX	XXXXX	11,766,390.00	11,766,390.00	
Total Price for Schedule 1AB24										Baht	91,660,745.00	Baht	11,766,390.00



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB25 : Fault Recording System
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB25-1	DSS : Fault Recording System	-See Bill of Materials Item No. 1AB25-1 -See Scope of Work -Specification Nos. 1003 and 1008 -Drawing No. BBG2-E-1	1	SET					3,177,296.00	3,177,296.00	XXXXX	XXXXX	
1AB25-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB25-1		Lump sum	Lump sum			XXXXX	XXXXX	XXXXX	XXXXX	336,491.00	336,491.00	
Total Price for Schedule 1AB25									Baht 3,177,296.00		Baht 336,491.00		


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB33 : CCTV
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB33-1	CCTV System and accessories including:	1	SET					3,436,913.00	3,436,913.00	XXXXX	XXXXX	
	(1) Outdoor PTZ Dome Camera (1EA) (2) Indoor Fixed Camera (7EA) (3) Outdoor Fixed Camera (18EA) (4) PC Workstation (1EA) (5) Server (1EA) (6) Software license (6.1) Software management license (1EA) (6.2) Redording license (26EA) (6.3) Video analytic license (26EA) (7) Ethernet I/O Module (1EA) (8) Monitor (4EA) (9) HDMI Optical Extender (2SET) (10) LAN Switch (2EA) (11) CCTV Rack Cabinet Size: 60x60x218.5cm. Front door: Steel sheet with Plastic Acrylic Rear door: Perforated steel sheet (1EA)											

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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB33 : CCTV
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
	(12) CCTV steel box/ End-point steel box (Lumpsum)											
	(13) Monitoring Desk (1EA)											
	(14) PoE Injector for Fixed camera(25EA)											
	(15) Adapter for PTZ camera (1EA)											
	(16) CCTV Pole 2 เมตร (Lumpsum)											
	(17) CCTV Pole 4 เมตร (Lumpsum)											
	(18) Indoor-type twisted pair cable(Lumpsum)											
	(19) Outdoor-type twisted pair cable(Lumpsum)											
	(20) 12-core ADSS Optical Fiber Cable(Lumpsum)											
	(21) Media Converter (UTP-Fiber Optic) (44EA)											
	(22) Surge protection-220VAC (7EA)											
	(23) Line Filter(7EA)											
	(24) สายไฟฟ้า (Lumpsum)											
	(25) ท่อ EMT (Lumpsum)											
	(26) ท่อ IMC, เหล็กอ่อนกันน้ำมี PVC หุ้ม (Lumpsum)											
	(27) E-flex (Lumpsum)											
	(28) Ground System (Lumpsum)											
	(29) Accessories (Lumpsum)											


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB33 : CCTV
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB33-2	Cost of Local Transportation Construction and Installation for Item no 1AB33-1	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	293,648.00	293,648.00		
	<p>IMPORTANT :</p> <p>1. The Bidders are required to propose their estimated quantities for such item together with their bid proposal for EGAT's consideration</p> <p>2. Telecommunication Equipment supplied under Schedule 1AB33 shall conform to Specification No SD-CCTV-P01, Drawing No. DW-COM-D01-005-ALL-10 and DW-CAB-D01-019</p>											
Total Price for Schedule 1AB33							Baht 3,436,913.00		Baht 293,648.00			

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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power Panel
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB34-1	Vented Type Lead-Acid Station Battery 48 VDC with capacity not less than 600 Ah (Tubular Plate) at 10 Hour rated, 24 Cells, Nominal Voltage 2 Volt/Cell, with Rack 1 set (230/115 kV Control Building at Ban Bueng2 (GIS))	1	SET	THB	187,300.00	187,300.00			XXXXX	XXXXX		
1AB34-2	Conventional Type Charger 48 VDC, 150 A (230/115 kV Control Building at Ban Bueng2 (GIS))	2	SET				257,200.00	514,400.00	XXXXX	XXXXX		
1AB34-3	48 VDC Load Center Type 1: 60 Breaker (230/115 kV Control Building at Ban Bueng2 (GIS))	1	SET				137,500.00	137,500.00	XXXXX	XXXXX		
1AB34-4	Local Transportation, Construction and Installation for Item No. 1AB34-1, 1AB34-2 and 1AB34-3	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	81,900.00	81,900.00		
Total Price for Schedule 1AB34				THB	187,300.00		Baht 651,900.00		Baht 81,900.00			



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB35 : Communication Cable
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB35-1 1AB35-1.1	Optical Fiber Cable from fiber frame termination cabinet at Ban Bueng 2 230/115 kV control building to 2-way joint box at 230 kV Bo Win take-off structure Supply of optical fiber cable and accessories including (a) 36-core non-metallic optical fiber cable(approx. 400 meter) (b) Rigid steel conduit from takeoff structure to cable trench (lump sum) (c) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp(lump sum) (d) Rack cabinet and accessories(Ban Bueng 2 230/115 kV control building- 1 set) (e) Fiber frame termination cabinet with cable tray(Ban Bueng 2 230/115 kV control building- 1 set) (f) 36 pigtails (1.5 meter) (Ban Bueng 2 230/115 kV control building- 1 set) (g) 6-wire cleat for coiling optical fiber cable at takeoff structure (4 set)	1	LOT					158,900.00	158,900.00	XXXXXX	XXXXXX	


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB35 : Communication Cable
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB35-1.2	Local transportation, Construction and Installation for item 1AB35-1.1 (including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	168,000.00	168,000.00		

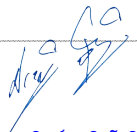

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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB35 : Communication Cable
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB35-2	Optical Fiber Cable from fiber frame termination cabinet at Ban Bueng 2 230/115 kV control building to 2-way joint box at 115 kV Ban Bueng take-off structure											
1AB35-2.1	Supply of optical fiber cable and accessories including (a) 36-core non-metallic optical fiber cable(approx. 350 meter) (b) Rigid steel conduit from takeoff structure to cable trench (lump sum) (c) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp(lump sum) (d) Fiber frame termination cabinet with cable tray(Ban Bueng 2 230/115 kV control building- 1 set) (e) 36 pigtails (1.5 meter) (Ban Bueng 2 230/115 kV control building- 1 set) (f) 6-wire cleat for coiling optical fiber cable at takeoff structure (4 set)	1	LOT					122,900.00	122,900.00	XXXXX	XXXXX	
1AB35-2.2	Local transportation, Construction and Installation for item 1AB35-2.1 (including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	147,000.00	147,000.00	



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB35 : Communication Cable
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
	<p>IMPORTANT:</p> <p>1. Telecommunication Equipment supplied under Schedule AB35 shall conform to Telecommunication Equipment Specification Single Sheath Non-metallic Optical Fiber Cable (SD-FOT-P22).</p> <p>2. The Bidder shall be required to later break down the unit price for sub-items of this schedule for consideration</p>											
Total Price for Schedule 1AB35									Baht	281,800.00	Baht	315,000.00



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1AB39 : Commissioning
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	3,062,000.00	3,062,000.00		
Total Price for Schedule 1AB39							Baht		Baht 3,062,000.00			


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MEDIUM COST FOR BID NO. TS12-S-26(R)

1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-1	230 kV Take off Structure Foundation (TS801) Pile Type (Dowel bar , Pile cut off and Pile shoe are included)	FD-TS-8-02	6	set	287,730.30	1,726,381.80
1C1-2	230 kV Take off Structure Foundation (TS802) Short Pile Type (Dowel bar , Pile cut off and Pile shoe are included)	FD-TS-8-08	6	set	391,788.10	2,350,728.60
1C1-3	115/230 kV General equipment support structure foundation (BP701,BP801, CC704,CT702,CT802,VT703,VT803, LA401, LA402, LA801, LA802) Short Pile Type (BP801) (Dowel bar , Pile cut off and Pile shoe are included)	FD-GE-0-02	9	set	11,821.70	106,395.30
1C1-4	230 kV GIS bushing structure foundation (Pad type / Pile type) (GBS801) (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor HICO/CM2-FD-GTS801 See Scope of work	24	set	43,322.40	1,039,737.60
1C1-5	230 kV GIB-1 support structure foundation (Pile type) (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor HICO/CM2-FD-GIB8-3 See Scope of work	Lump Sum	Lump Sum	314,601.10	314,601.10


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1C1 : Foundation Work

**SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12**

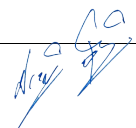


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Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-6	230 kV GIB-2 support structure foundation (Pile type) (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor HICO/CM2-FD-GIB8-3 See Scope of work	Lump Sum	Lump Sum	16,388.90	16,388.90
1C1-7	230 kV GIB-3 support structure foundation (Pile type) (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor HICO/CM2-FD-GIB8-3 See Scope of work	Lump Sum	Lump Sum	911,064.00	911,064.00
1C1-8	115/230 kV General equipment support structure foundation (BP701,BP801, CC704,CT702,CT802,VT703,VT803, LA401, LA402, LA801, LA802) Short Pile Type (LA802)(Dowel bar , Pile cut off and Pile shoe are included)	FD-GE-0-02	15	set	15,471.50	232,072.50
1C1-9	22 kV Bus support structure foundation (BS201,BS202,BS203,BS204) Pile Type (BS203)(Dowel bar , Pile cut off and Pile shoe are included)	FD-BS-2-02	2	set	34,299.10	68,598.20
1C1-10	22&33 kV Distribution Transformer foundation (DX402) Short Pile Type (Dowel bar , Pile cut off and Pile shoe are included)	FD-DX-4-02	2	set	27,916.90	55,833.80



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1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-11	Lighting Relay Panel foundation(RP002) Pad Type	FD-RP-0-03	1	set	7,024.60	7,024.60
1C1-12	Junction Box Structure foundation (JB003) Pad Type	FD-JB-0-05	2	set	5,571.50	11,143.00
1C1-13	Junction Box Structure foundation (JB001) Pad Type	FD-JB-0-03	2	set	5,923.50	11,847.00
1C1-14	Lamp post for fence and access road lighting foudation (LP3) (LED type) Pad Type & Pile Type (Dowel bar , Pile cut off and Pile shoe are included)	FD-LP-0-05	27	set	15,329.60	413,899.20
1C1-15	30m Telecommunication Tower Foundation(WSA.) Pile , Bored pile Type (Dowel bar , Pile cut off and Pile shoe are included)	FD-TT-0-08	1	set	210,549.90	210,549.90
1C1-16	Fire wall (Dowel bar , Pile cut off and Pile shoe are included)	FD-FW-0-02	2	set	702,126.70	1,404,253.40
1C1-17	Modified T-200 Transformer Foundation for Installing Removable Deadman Hook (DM-I and RC.Deadman Hook for Loading Out DM-O) Pad type	FD-TX-8-03	3	set	110,750.20	332,250.60



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1C1 : Foundation Work
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-18	Transformer Foundation (T-300) Long pile Type (Dowel bar , Pile cut off and Pile shoe are included)	FD-TX-8-04	3	set	594,960.30	1,784,880.90
1C1-19	Outdoor marshalling Cubicle foundation and SubTrench (MC002) Pad Type	FD-MC-0-06	3	set	10,662.30	31,986.90
1C1-20	Outdoor Load Break Switch foundation. (LBS)	Designed by Contractor FD-DX-4-02	2	set	27,916.90	55,833.80
Total Price for Schedule 1C1					Baht 11,085,471.10	


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MEDIUM COST FOR BID NO. TS12-S-26(R)

1C2 : Cable Trench

SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C2-1	Standard cable trench, steel cover included (Type"A")	SD-CE-0-02 See Dwg.No.BBG2-C-3	Lump Sum	Lump Sum	4,365,660.97	4,365,660.97
1C2-2	Standard cable trench, steel cover included (Type"B")	SD-CE-0-02 See Dwg.No.BBG2-C-3	Lump Sum	Lump Sum	450,133.20	450,133.20
1C2-3	Cable trench, steel cover included (Type"A")	Designed by Contractor See Dwg.No.BBG2-C-3	Lump Sum	Lump Sum	465,801.60	465,801.60
Total Price for Schedule 1C2					Baht	5,281,595.77



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MEDIUM COST FOR BID NO. TS12-S-26(R)

1C3 : Building

SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C3-1	230/115 kV Control Building	Designed by Contractor SD-CD-0-01A See Dwg.No.BBG2-C-3 See Scope of work	Lump Sum	Lump Sum	49,442,642.42	49,442,642.42
1C3-1.1	Air conditioning system and Ventilation system					
1C3-1.1.1	Minimum 30,000 BTU split-type air conditioner, including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		1	set	43,501.39	43,501.39
1C3-1.1.2	Minimum 36,000 BTU split-type air conditioner, including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		1	set	47,694.28	47,694.28
1C3-1.1.3	Minimum 40,000 BTU split-type air conditioner, including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		2	set	61,321.23	122,642.46
1C3-1.1.4	Minimum 48,000 BTU split-type air conditioner, including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		2	set	63,836.97	127,673.94

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1C3 : Building

SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C3-1.1.5	Minimum 60,000 BTU split-type air conditioner (Invertor), including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		16	set	67,072.92	1,073,166.72
1C3-1.1.6	Extra work for air conditioning system		Lump Sum	Lump Sum		
1C3-1.1.7	Ventilation system		Lump Sum	Lump Sum		
1C3-2	230 kV GIS Building	Designed by Contractor SD-GIS-8-01A See Dwg.No.BBG2-C-3 See Scope of work	Lump Sum	Lump Sum	60,813,385.02	60,813,385.02


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1C3 : Building
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C3-2.1	Air conditioning system and Ventilation system					
1C3-2.1.1	Ventilation system		Lump Sum	Lump Sum		
Total Price for Schedule 1C3					Baht 111,670,706.23	


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MEDIUM COST FOR BID NO. TS12-S-26(R)
1C4 : Earth Work, Road and Crushed Rock Surfacing
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C4-1	Crushed rock surfacing 0.10 m thickness	See Dwg. BBG2-C-1	Lump Sum	Lump Sum	2,712,160.00	2,712,160.00
1C4-2	RC.Road type " E " section 6 - 6 (6.00,8.00,16.00 m (width))	SD-RD-0-01 See Dwg. BBG2-C-6	Lump Sum	Lump Sum	5,440,160.00	5,440,160.00
1C4-3	Transformer loading	SD-RD-0-03 See Dwg. BBG2-C-6	Lump Sum	Lump Sum	650,786.40	650,786.40
Total Price for Schedule 1C4					Baht 8,803,106.40	



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1C5 : Water Supply System
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C5-1	Water supply system	Designed by Contractor See Scope of work See Dwg.BBG2-C-9	Lump Sum	Lump Sum	345,026.00	345,026.00
1C5-2	Water storage tank capacity 2,000 liters, Polyethylene type	Designed by Contractor	1	set	18,360.10	18,360.10
1C5-3	Automatic Pump with pressure tank	Designed by Contractor	1	set	18,360.10	18,360.10
Total Price for Schedule 1C5					Baht	381,746.20


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MEDIUM COST FOR BID NO. TS12-S-26(R)

1C6 : Drainage System

SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C6-1	Drainage System	Designed by Contractor See Scope of work See Dwg.BBG2-C-6	Lump Sum	Lump Sum	9,592,666.38	9,592,666.38
1C6-2	Oil separator (Pile type)	SD-OS-0-02	1	set	1,165,220.10	1,165,220.10
1C6-3	Oil pit with steel grating (fot T-300)	WD-DN-0-04	114	m	20,807.60	2,372,066.40
1C6-4	PC. or RC. Pile sq. 0.18 * 0.18 m (Dowel bar, Pile cut off and Pile shoe are included)	SD-PL-0-01	Lump Sum	Lump Sum	89,676.40	89,676.40
Total Price for Schedule 1C6					Baht 13,219,629.28	



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1C7 : Special Construction Works
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C7-1	Architectural and Civil engineering design work	-	Lump Sum	Lump Sum	1,613,938.48	1,613,938.48
1C7-2	Test and commissioning for inert gas system (Test in Electrical room)	-	Lump Sum	Lump Sum	70,000.00	70,000.00
1C7-3	Test and commissioning for fire pump system	-	Lump Sum	Lump Sum	60,000.00	60,000.00
1C7-4	Test and commissioning for foam-water spray system (for Transformer / Shunt reactor)	Designed by Contractor	3	set	40,000.00	120,000.00
1C7-5	Fire Protection design work		Lump sum	Lump sum	518,061.42	518,061.42


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1C7 : Special Construction Works
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C7-6	3D Animation presentation file		Lump sum	Lump sum	160,000.00	160,000.00
1C7-7	Dynamic Pile load test		Lump Sum	Lump Sum	390,000.00	390,000.00
1C7-8	Static pile load test		1	set	179,350.00	179,350.00
Total Price for Schedule 1C7					Baht 3,111,349.90	



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1C8 : Miscellaneous
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C8-1	Wire mesh fence and gate (Pile type)	SD-CF-0-01 See Dwg. BBG2-C-1	Lump Sum	Lump Sum	1,052,095.00	1,052,095.00
1C8-2	PC. or RC. Pile sq. 0.18 * 0.18 m (Dowel bar, Pile cut off and Pile shoe are included)	SD-PL-0-01	Lump Sum	Lump Sum	782,679.59	782,679.59
1C8-3	Bored hole for soil investigation 15 m depth/hole		6	set	13,880.90	83,285.40
Total Price for Schedule 1C8					Baht 1,918,059.99	


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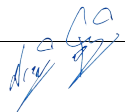
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MEDIUM COST FOR BID NO. TS12-S-26(R)
1C9 : Fire Protection System
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C9-1	Fire Protection System for 230 kV Control Building (please give detail and breakdown)	Designed by Contractor	Lump Sum	Lump Sum	8,536,100.00	8,536,100.00
1C9-2	Fire Protection System for 230 kV GIS Building (please give detail and breakdown)	Designed by Contractor	Lump Sum	Lump Sum	4,832,700.00	4,832,700.00
1C9-3	Water storage tank min. capacity 250 cu.m	WD-UT-0-05	1	set	2,692,734.00	2,692,734.00
1C9-4	Fire pump house	SD-FPH-8-01	1	set	1,468,764.00	1,468,764.00
1C9-5	Fire pump system	Designed by Contractor	Lump Sum	Lump Sum	4,895,880.00	4,895,880.00
1C9-6	Fire Protection System for switchyard	Designed by Contractor	Lump Sum	Lump Sum	2,030,377.50	2,030,377.50
1C9-7	Foam house	SD-FH-8-01	1	set	979,176.00	979,176.00
1C9-8	Bladder tank proportioning system and components	Designed by Contractor	Lump Sum	Lump Sum	909,000.00	909,000.00


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1C9 : Fire Protection System
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C9-9	Fire Protection System for transformer / shunt reactor	Designed by Contractor	3	set	468,523.00	1,405,569.00
1C9-10	Fire Protection environmental monitoring system	Designed by Contractor	Lump Sum	Lump Sum	938,620.00	938,620.00
1C9-11	PC. or RC. Pile sq. 0.18 * 0.18 m (Dowel bar, Pile cut off and Pile shoe are included)	SD-PL-0-01	Lump Sum	Lump Sum	2,821,354.80	2,821,354.80
1C9-12	PC. or RC. Pile sq. 0.26 * 0.26 m.(Dowel bar , Pile cut off and Pile shoe are included)	SD-PL-0-01	Lump Sum	Lump Sum	9,892,690.50	9,892,690.50
1C9-13	Wheel fire extinguisher (1*50 lbs)		4	set	85,677.90	342,711.60
1C9-14	Cabinet for Wheel fire extinguisher	HS-WR-0-04	2	set	73,438.20	146,876.40
Total Price for Schedule 1C9					Baht	41,892,553.80


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นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
1D7 : Spare Parts for SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
1D7-1	Gas density meter with two-stage contacts for circuit breaker compartment spare parts for GIS	1	set	THB	23,733.00	23,733.00			XXXXX	XXXXX		
1D7-2	Gas density meter for other compartment spare parts for GIS	1	set	THB	48,308.00	48,308.00			XXXXX	XXXXX		
1D7-3	Rupture disc of overpressure protection device spare parts for GIS (1EA for each type/each operating pressure)	1	set	THB	23,740.00	23,740.00			XXXXX	XXXXX		
1D7-4	Pump with motor for hydraulic spare parts for GIS (if any)	1	set	THB	included	included			XXXXX	XXXXX		
1D7-5	Maintenance closing device for circuit breaker	1	set	THB	33,352.00	33,352.00			XXXXX	XXXXX		
1D7-6	SF6 gas filling cart accessories for GIS	1	set	THB	322,564.00	322,564.00			XXXXX	XXXXX		
1D7-7	Operating Analyzer Fitting Means accessories for GIS	1	set	THB	230,864.00	230,864.00			XXXXX	XXXXX		


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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
1D7 : Spare Parts for SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
1D7-8	Hand pump for hydraulic accessories for GIS (if any)	1	set	THB	included	included			XXXXX	XXXXX		
1D7-9	Loose pressure gauge completed with necessary fitting for circuit breaker compartment accessories for GIS(3 phases set precision pressure gauge spare parts for GIS can be combined with Gas density meter for CB	1	set	THB	included	included			XXXXX	XXXXX		
1D7-10	Cost of Local Transportation for Item No 1D7-1 thru 1D7-9	Lump sum	Lump sum	THB	XXXXXX	XXXXXX	XXXXXX	XXXXXX	34,128.05	34,128.05		
Total Price for Schedule 1D7				THB	682,561.00		Baht		Baht 34,128.05			



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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
1D11 : Spare Parts for Power Fuse, Fuse Link and Hook Stick
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
1D11-1	Fuse link or refill unit20E for 22 kV power fuse (Standard Speed)	6		THB	15,478.10	92,868.60			XXXXX	XXXXX		
1D11-2	6.10 m. (20 ft.) hook stick, (14 ft universal with male pin and 6 ft pole extention with female pin) for use with the power fuse	1		THB	32,418.10	32,418.10			XXXXX	XXXXX		
1D11-3	Cost of Local Transportation for Item No 1D11-1 thru 1D11-2											
		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	6,264.34	6,264.34		
				THB	125,286.70		Baht		Baht			
Total Price for Schedule 1D11									6,264.34			


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 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
1D12 : Spare Parts for AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
1D12-1	Fuse time lag type 800 A	6					16,028.00	96,168.00	XXXXX	XXXXX		
1D12-2	Cost of Local Transportation for Item No 1D12-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	4,808.40	4,808.40		
Total Price for Schedule 1D12							Baht		Baht			
							96,168.00		4,808.40			

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Dr. G. S.
นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
1D22 : Spare Parts for Grounding Material
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
1D22-1	Portable temporary grounding tools for maintenance as per Specification attached	1	set	THB	476,315.20	476,315.20			XXXXX	XXXXX		
1D22-2	Cost of Local Transportation for Item No 1D22-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	23,815.76	23,815.76		
Total Price for Schedule 1D22				THB	476,315.20		Baht		23,815.76			



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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
1D24 : Spare Parts for Control and Protection System
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
						Unit Price	Amount	Unit Price	Amount				
1D24-1	DSS : Spare Parts	-See Bill of Materials for 1D24-1 -Specification No. 1008	1	SET			11,604,294.00	11,604,294.00	XXXXX	XXXXX			
1D24-2	Cost of Local Transportation for Item No. 1D24-1		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	43,771.00	43,771.00		
Total Price for Schedule 1D24								Baht	11,604,294.00	Baht	43,771.00		



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MEDIUM COST FOR BID NO. TS12-S-26(R)
1D25 : Spare Parts for Fault Recording System
SUPPLY AND CONSTRUCTION OF 230 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
						Unit Price	Amount	Unit Price	Amount				
1D25-1	DSS : Digital Fault Recorder Equipment	-Spare DFR equipment is same ordering number as supplied in schedule 1AB25 -Specification Nos. 1003 and 1008	1	EA				847,556.00	847,556.00	XXXXX	XXXXX		
1D25-2	Cost of Local Transportation for Item No. 1D25-1												
			Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	11,016.00	11,016.00		
Total Price for Schedule 1D25								Baht 847,556.00		Baht 11,016.00			


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01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB4 : Surge Arrester
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB4-1	108 kV Surge Arrester as per Ratings and Features RF SA7Y11	27		THB	77,000.00	2,079,000.00			XXXXXX	XXXXXX		
2AB4-2	Steel Supporting Structure for SA7Y11(for Item No. 2AB4-1), H=4.50 m as per Dwg. No. ST-LA-7-01 and SD-AB-0-01	27		THB			24,000.00	648,000.00	XXXXXX	XXXXXX		
2AB4-3	Cost of Local Transportation, Construction and Installation for Item No. 2AB4-1 thru 2AB4-2			THB	XXXXXX	XXXXXX	XXXXXX	XXXXXX	272,700.00	272,700.00		
				THB	2,079,000.00		Baht		Baht			
Total Price for Schedule 2AB4							648,000.00		272,700.00			

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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB7 : SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB7-1	123 kV 3150 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7543(IEC) and Drawing No. BBG2-S-1-03/04, BBG2-S-1-04/04 and BBG2-S-2-01/01 (KT1A & C-Bank)	1		THB	57,379,554.00	57,379,554.00			XXXXX	XXXXX		
2AB7-2	123 kV 3150 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7543(IEC) and Drawing No. BBG2-S-1-03/04, BBG2-S-1-04/04 and BBG2-S-2-01/01 (Line no.1 to Ban Bueng & KT2A)	1		THB	57,379,554.00	57,379,554.00			XXXXX	XXXXX		
2AB7-3	123 kV 3150 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7543(IEC) and Drawing No. BBG2-S-1-03/04, BBG2-S-1-04/04 and BBG2-S-2-01/01 (Line no.2 to Ban Bueng & Future line)	1		THB	57,379,554.00	57,379,554.00			XXXXX	XXXXX		
2AB7-4	123 kV 3150 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7543(IEC) and Drawing No. BBG2-S-1-03/04, BBG2-S-1-04/04 and BBG2-S-2-01/01 (Future line & Line no.1 to PEA)	1		THB	57,379,554.00	57,379,554.00			XXXXX	XXXXX		
2AB7-5	123 kV 3150 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7543(IEC) and Drawing No. BBG2-S-1-03/04, BBG2-S-1-04/04 and BBG2-S-2-01/01 (Line no.2 to PEA & KT3A)	1		THB	57,379,554.00	57,379,554.00			XXXXX	XXXXX		

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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB7 : SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB7-6	123 kV 3150 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7543(IEC) and Drawing No. BBG2-S-1-03/04, BBG2-S-1-04/04 and BBG2-S-2-01/01 (C-Bank & Line no.3 to PEA)	1		THB	57,379,554.00	57,379,554.00			XXXXX	XXXXX		
2AB7-7	123 kV 3150 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7543(IEC) and Drawing No. BBG2-S-1-03/04, BBG2-S-1-04/04 and BBG2-S-2-01/01 (Metal Enclosed Bus) including VTs and fast-acting earthing switches at main bus	1	lot	THB	included	included			XXXXX	XXXXX		
2AB7-8	123 kV 3150 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7543(IEC) outdoor type (GIB) as per Drawing No. BBG2-S-1-03/04, BBG2-S-1-04/04 and BBG2-S-2-01/01	1	lot	THB	included	included			XXXXX	XXXXX		
2AB7-9	Local control cubicle for IS7543 for item 2AB7-1 thru 2AB7-8*	18	set	THB	included	included			XXXXX	XXXXX		
2AB7-10	Steel Supporting Structure for IS7543*	1	lot	THB	included	included			XXXXX	XXXXX		
2AB7-11	Removable service platform and removable ladder for GIS inspection	1	lot	THB	included	included			XXXXX	XXXXX		

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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB7 : SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

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Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB7-12	Cost of Local Transportation, Construction and Installation for Item No. 2AB7-1 thru 2AB7-11			THB	XXXXX	XXXXXX	XXXXXX	XXXXXX	34,427,732.40	34,427,732.40		
	Note : The SF6 gas in a quantity equivalent to 115% of the total equipment actual requirement shall be provided as follows: - 100% of SF6 gas quantity shall be shipped in returnable steel bottles which shall be returned back to Contractor. - 15% of SF6 gas quantity shall be shipped in non-returnable steel bottles which shall become the property of EGAT.											
Total Price for Schedule 2AB7				THB	344,277,324.00		Baht		Baht 34,427,732.40			


* The design of supporting structures and LCCs for Gas Insulated Switchgear shall be verified by Gas Insulated Switchgear manufacturer.

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 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB10 : Disconnecting Switch
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB10-1	123 kV 2000 A air switch motor operated as per Ratings and Features RF DS77A1(IEC) (phase spacing = 2.25 m)	2		THB	432,146.00	864,292.00			XXXXX	XXXXX		
2AB10-2	Steel Supporting Structure for DS77A1 as per EGAT's Dwg. No. ST-DS-4-01 and SD-AB-0-01, H = 5.30 m	2					82,717.00	165,434.00	XXXXX	XXXXX		
2AB10-3	Cost of Local Transportation, Construction and Installation for Item No. 2AB10-1 thru 2AB10-2											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	102,972.60	102,972.60		
Total Price for Schedule 2AB10				THB	864,292.00		Baht	165,434.00		Baht	102,972.60	


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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB12 : AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB12-1	Lighting Relay Panel (LRP) as per Dwg. No. LT-RP-0-03	1						92,148.00	92,148.00	XXXXX	XXXXX	
2AB12-2	Termination Box type TB1 as per Dwg No. LT-TB-0-01	16						3,236.00	51,776.00	XXXXX	XXXXX	
2AB12-3	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4 (For 115 kV BBG2 GIS, designed by Contractor)	1						195,405.00	195,405.00	XXXXX	XXXXX	
2AB12-4	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4 (For 115 kV BBG2 GIS, designed by Contractor)	1						148,305.00	148,305.00	XXXXX	XXXXX	
2AB12-5	Cost of Local Transportation, Construction and Installation for Item No. 2AB12-1 thru 2AB12-4	Lump sum	Lump sum					XXXXXX	XXXXXX	XXXXXX	XXXXXX	
Total Price for Schedule 2AB12										Baht	Baht	
										487,634.00	48,763.40	


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นางสาวเบญญาลักษณ์ ศรีลัมพ์
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 01 Dec 2023

MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB14 : Substation Steel Structure
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB14-1	115 kV take-off structure (TS702) as per Dwg. No. ST-TS-7-02	15						192,856.94	2,892,854.10	XXXXX	XXXXX	
2AB14-2	115 kV beam (BB703) as per Dwg. No. ST-BB-7-03	10						67,124.23	671,242.30	XXXXX	XXXXX	
2AB14-3	115 kV bus pole structure (BP705) as per Dwg. No. ST-BP-7-01	24						21,539.87	516,956.88	XXXXX	XXXXX	
2AB14-4	Disconnecting switch operating platform (OP002) as per Dwg. No. ST-OP-0-02	2						12,523.18	25,046.36	XXXXX	XXXXX	
2AB14-5	Cost of Local Transportation, Construction and Installation for Item No. 2AB14-1 thru 2AB14-4	Lump sum	Lump sum					XXXXX	XXXXX	XXXXX	XXXXX	
Total Price for Schedule 2AB14								Baht		Baht		
								4,106,099.64		1,026,524.91		


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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB15 : Insulator
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB15-1	Suspension insulator ANSI 52-3 as per Specification attached	Lump sum	Lump sum		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX		
2AB15-2	115 kV station post insulator ANSI TR. No. 286 as per Specification attached	Lump sum	Lump sum		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX		
2AB15-3	Cost of Local Transportation, Construction and Installation for Item No. 2AB15-1 thru 2AB15-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	68,396.63	68,396.63		
Total Price for Schedule 2AB15									Baht	68,396.63		



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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB18 : Low Voltage Cable and Conductor
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum				3,020,644.00	3,020,644.00	XXXXX	XXXXX		
2AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum				1,899,095.00	1,899,095.00	XXXXX	XXXXX		
2AB18-3	750 V lighting cable (THW) as per Specification attached	Lump sum	Lump sum				110,000.00	110,000.00	XXXXX	XXXXX		
2AB18-4	750 V lighting cable (NYY) as per Specification attached	Lump sum	Lump sum				222,475.00	222,475.00	XXXXX	XXXXX		
2AB18-5	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				2,385,322.50	2,385,322.50	XXXXX	XXXXX		
2AB18-6	Overhead ground wire as per Specification attached	Lump sum	Lump sum				29,326.00	29,326.00	XXXXX	XXXXX		
2AB18-7	Aluminum conductor as per Specification attached	Lump sum	Lump sum				198,000.00	198,000.00	XXXXX	XXXXX		
2AB18-8	Cost of Local Transportation, Construction and Installation for Item No. 2AB18-1 thru 2AB18-7	Lump sum	Lump sum			XXXXXX	XXXXXX	XXXXXX	XXXXXX	1,966,215.63	1,966,215.63	
Total Price for Schedule 2AB18								Baht 7,864,862.50	Baht 1,966,215.63			



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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB19 : Switchyard Lighting Fixtures
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB19-1	Flood lighting fixture, LED lamp, 10000 lumen, wide-beam, complete with control gear as per Specification attached	26						13,505.80	351,150.80	XXXXX	XXXXX	
2AB19-2	Street lighting fixture, LED lamp, 5000 lumen, wide beam, complete with control gear as per Specification attached	17						13,505.80	229,598.60	XXXXX	XXXXX	
2AB19-3	Tapered galvanized steel lamp post H=5000 mm. complete with 2 A 250 V plug fuse, 20 A 500 V terminal block for accepting 4 sq.mm. of incoming and outgoing cables and anchor bolts as per Dwg. No. ST-LP-0-03 and SD-AB-0-01	17						20,829.60	354,103.20	XXXXX	XXXXX	
2AB19-4	Cost of Local Transportation, Construction and Installation for Item No. 2AB19-1 thru 2AB19-3							XXXXX	XXXXX	XXXXX	XXXXX	
		Lump sum	Lump sum					XXXXX	XXXXX	233,713.15	233,713.15	
Total Price for Schedule 2AB19										Baht	Baht	
										934,852.60	233,713.15	


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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB20 : Aluminum Tube, Connector and Miscellaneous Hardware
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht				
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount	
					CIF Thai Port		Ex-works Price (excluding VAT) Baht						
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount			
2AB20-1	Aluminum tube as per Specification attached							218,344.50	218,344.50	XXXXX	XXXXX		
		Lump sum	Lump sum										
2AB20-2	115 kV and below Compression connector as per Specification attached							83,583.50	83,583.50	XXXXX	XXXXX		
		Lump sum	Lump sum										
2AB20-3	115 kV and below Miscellaneous hardware as per Specification attached							119,626.25	119,626.25	XXXXX	XXXXX		
		Lump sum	Lump sum										
2AB20-4	Cost of Local Transportation, Construction and Installation for Item No. 2AB20-1 thru 2AB20-3							XXXXXX	XXXXXX	XXXXXX	XXXXXX		
		Lump sum	Lump sum							105,388.56	105,388.56		
Total Price for Schedule 2AB20										Baht	421,554.25	Baht	105,388.56

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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB21 : Bus Fitting
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB21-1	115 kV and below Bus fitting as per Specification attached	Lump sum	Lump sum	THB	450,240.65	450,240.65			XXXXX	XXXXX		
2AB21-2	Cost of Local Transportation, Construction and Installation for Item No. 2AB21-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	112,560.16	112,560.16		
Total Price for Schedule 2AB21				THB	450,240.65		Baht		112,560.16			

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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB22 : Grounding Material
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht					
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount		
					CIF Thai Port		Ex-works Price (excluding VAT) Baht							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount				
2AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	54,687.60	54,687.60			XXXXX	XXXXX				
2AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				347,683.77	347,683.77	XXXXX	XXXXX				
2AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	62,117.38	62,117.38			XXXXX	XXXXX				
2AB22-4	Cost of Local Transportation, Construction and Installation for Item No. 2AB22-1 thru 2AB22-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	116,122.19	116,122.19				
Total Price for Schedule 2AB22				THB	116,804.98		Baht		347,683.77		Baht		116,122.19	


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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB23 : Substation Miscellaneous
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB23-1	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum					930,600.00	930,600.00	XXXXXX	XXXXXX	
2AB23-2	Heat shrinkable insulation material	Lump sum	Lump sum	THB	75,573.30	75,573.30				XXXXXX	XXXXXX	
2AB23-3	Cost of Local Transportation, Construction and Installation for Item No. 2AB23-1 thru 2AB23-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	251,543.33	251,543.33	
Total Price for Schedule 2AB23												
				THB	75,573.30		Baht	930,600.00		Baht	251,543.33	


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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2AB24-1	DSS : Digital Substation System including System Integrator	-See Bill of Materials Item No. 2AB24-1 -See Scope of Work -Specification No. 1008 -Drawing Nos. BBG2-E-1 and TP-E-20.3	1	SET				120,338,492.00	120,338,492.00	XXXXXX	XXXXXX
2AB24-2	EGAT-PEA INTERFACING PANEL(2-REMOTE I/O AND ACCESSORIES)	-Panel No. EGAT-PEA Interfacing -See Scope of Work -Drawing No. BBG2-E-1	1	EA				1,060,183.00	1,060,183.00	XXXXXX	XXXXXX


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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2AB24-3	36 Cores Non-metallic Optical Fiber Cable	-See Scope of Work -Specification No. SD-FOT-P22 -The length of OFC that connects between joint box at take-off structure and FTC in EGAT-PEA Interfacing Panel at Control Building shall conform to Drawing Nos. BBG2-S-2, BBG2-S-2-OFC, TYP2A-S-6 and TYP2A-S-7 -Drawing Nos. DW-FOT-D01-202-02 SH.P9&P11 and DW-FOT-D01-215-01 SH.P2	1	LOT				36,750.00	36,750.00	XXXXXX	XXXXXX
2AB24-4	6-WIRE CLEAT FOR COILING OPTICAL FIBER CABLE	-See Scope of Work -Specification No. SD-FOT-P22 -Drawing Nos. DW-FOT-D01-202-02 SH.P9&P11	1	SET				9,420.00	9,420.00	XXXXXX	XXXXXX

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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2AB24-5	EFLEX AND/OR HDPE CONDUIT WITH HOT-DIP GALVANIZED STEEL CLAMP	-See Scope of Work -Supplied with Hot-Dip Galvanized Steel Clamp 1 Set per 1 Meter of Conduit -Specification No. SD-FOT-P22 -The length of Conduit shall conform to Drawing Nos. BBG2-S-2, BBG2-S-2-OFC, TYP2A-S-6 and TYP2A-S-7 -Drawing Nos. DW-FOT-	1	LOT				47,600.00	47,600.00	XXXXXX	XXXXXX
2AB24-6	RIGID STEEL CONDUIT	-See Scope of Work -Specification No. SD-FOT-P22 -The length of RSC from joint box at take-off structure to cable trench shall conform to Drawing BBG2-S-2, BBG2-S-2-OFC, TYP2A-S-6 and TYP2A-S-7 -Drawing Nos. DW-FOT-D01-202-02 SH.P9&P11	1	LOT				6,430.00	6,430.00	XXXXXX	XXXXXX

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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
2AB24-7	2-Way Joint Boxes with Accessories for OPGW and 36 Cores Non-metallic Optical Fiber Cable	-Installed at take-off structure -See Scope of Work -Specification No. SD-FOT-P22 -Drawing Nos. DW-FOT-D01-202-02 SH.P9&P11	1	EA				11,816.00	11,816.00	XXXXXX	XXXXXX		
2AB24-8	Cost of Local Transportation, Construction and Installation for Item No. 2AB24-1 thru 2AB24-7												
			Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	15,680,132.00	15,680,132.00		
Total Price for Schedule 2AB24								Baht 121,510,691.00		Baht 15,680,132.00			

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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB25 : Fault Recording System
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2AB25-1	DSS : Fault Recording System	-See Bill of Materials Item No. 2AB25-1 -See Scope of Work -Specification Nos. 1003 and 1008	1	SET				4,177,230.00	4,177,230.00	XXXXX	XXXXX
2AB25-2	Cost of Local Transportation, Construction and Installation for Item No. 2AB25-1									439,530.00	439,530.00
Total Price for Schedule 2AB25										Baht	Baht
										4,177,230.00	439,530.00

Signature

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MEDIUM COST FOR BID NO. TS12-S-26(R)
2AB39 : Commissioning
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	2,669,000.00	2,669,000.00		
Total Price for Schedule 2AB39							Baht		Baht 2,669,000.00			


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MEDIUM COST FOR BID NO. TS12-S-26(R)
2C1 : Foundation Work
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C1-1	115 kV Take off Structure Foundation (TS702) Pile Type(Dowel bar , Pile cut off and Pile shoe are included)	FD-TS-7-07	15	set	77,589.60	1,163,844.00
2C1-2	115 kV Circuit breaker foundation pile type & bored pile type (CBT701)(Dowel bar , Pile cut off and Pile shoe are included)	FD-CB-7-41	4	set	37,582.60	150,330.40
2C1-3	115 kV Disconnecting Switch Support foundation (DS704) Pile Type (Dowel bar , Pile cut off and Pile shoe are included)	FD-DS-7-08	7	set	51,473.40	360,313.80
2C1-4	115/230 kV General equipment support structure foundation (BP701,BP801, CC704,CT702,CT802,VT703,VT803, LA401, LA402, LA801, LA802) Short Pile Type (CT702)(Dowel bar , Pile cut off and Pile shoe are included)	FD-GE-0-02	12	set	16,185.40	194,224.80


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MEDIUM COST FOR BID NO. TS12-S-26(R)

2C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C1-5	115/230 kV General equipment support structure foundation (BP701,BP801, CC704,CT702,CT802,VT703,VT803, LA401, LA402, LA801, LA802) Short Pile Type (BP701)(Dowel bar , Pile cut off and Pile shoe are included)	FD-GE-0-02	24	set	16,185.40	388,449.60
2C1-6	115 kV. GIS bushing structure foundation	Designed by Contractor PSP-SH1-FD-GIS-7-01 See Scope of work	12	set	30,119.10	361,429.20
2C1-7	115 kV. GIB support structure foundation	Designed by Contractor PSP-SH1-FD-GIB-7-01 See Scope of work	Lump Sum	Lump Sum	350,098.14	350,098.14
2C1-8	115/230 kV General equipment support structure foundation (BP701,BP801, CC704,CT702,CT802,VT703,VT803, LA401, LA402, LA801, LA802) Short Pile Type(LA701)(Dowel bar .	FD-GE-0-02	36	set	16,185.40	582,674.40

2km

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2km

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MEDIUM COST FOR BID NO. TS12-S-26(R)

2C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

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Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C1-9	Disconnecting Switch Operating Platform foundation (OP002)	FD-OP-0-02	7	set	2,750.00	19,250.00
2C1-10	RC. Slab for Skid Base 115 kV ,39.6 MVAR (SK719-S,SK719-L)	FD-SK-7-16	4	set	117,078.50	468,314.00
2C1-11	Lamp post for fence and access road lighting foudation (LP3) (LED type) Pad Type & Pile Type(Dowel bar , Pile cut off and Pile shoe are included)	FD-LP-0-05	17	set	15,329.60	260,603.20
2C1-12	Isolating Transformer Foundation (IST) Pile Type	FD-TX-0-02	1	set	46,229.70	46,229.70
2C1-13	Prestressed concrete pole 22.00 m (CP.22)(Dowel bar , Pile cut off and Pile shoe are included)	CP-SB-4-01	5	set	40,066.40	200,332.00
2C1-14	Lighting Relay Panel foundation (RP002) Pad Type	FD-RP-0-03	1	set	7,024.60	7,024.60
2C1-15	Junction Box Structure foundation (JB001) Pad Type	FD-JB-0-03	1	set	5,923.50	5,923.50

MEDIUM COST FOR BID NO. TS12-S-26(R)
2C1 : Foundation Work
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
Total Price for Schedule 2C1					Baht	4,559,041.34




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MEDIUM COST FOR BID NO. TS12-S-26(R)
2C2 : Cable Trench
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C2-1	Standard cable trench, steel cover included (Type"A")	SD-CE-0-02 See Dwg.No.BBG2-C-3	Lump Sum	Lump Sum	2,584,048.50	2,584,048.50
Total Price for Schedule 2C2					Baht 2,584,048.50	




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MEDIUM COST FOR BID NO. TS12-S-26(R)
2C3 : Building
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C3-1	115 kV GIS Building	Designed by Contractor SD-GIS-7-01A See Dwg.No.BBG2-C-3 See Scope of work	Lump Sum	Lump Sum	41,875,116.54	41,875,116.54
2C3-1.1	Air conditioning system and Ventilation system					
2C3-1.1.1	Ventilation system		Lump Sum	Lump Sum		
Total Price for Schedule 2C3					Baht	41,875,116.54


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MEDIUM COST FOR BID NO. TS12-S-26(R)
2C4 : Earth Work, Road and Crushed Rock Surfacing
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C4-1	Crushed rock surfacing 0.10 m thickness	See Dwg. BBG2-C-1	Lump Sum	Lump Sum	1,474,000.00	1,474,000.00
2C4-2	RC.Road type " E " section 6 - 6 (6.00,14.00 m (width))	SD-RD-0-01 See Dwg. BBG2-C-6	Lump Sum	Lump Sum	4,821,960.00	4,821,960.00
Total Price for Schedule 2C4					Baht 6,295,960.00	



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MEDIUM COST FOR BID NO. TS12-S-26(R)
2C6 : Drainage System
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C6-1	Drainage System	Designed by Contractor See Scope of work See Dwg.BBG2-C-6	Lump Sum	Lump Sum	8,650,243.25	8,650,243.25
Total Price for Schedule 2C6					Baht 8,650,243.25	



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MEDIUM COST FOR BID NO. TS12-S-26(R)
2C7 : Special Construction Works
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C7-1	64 sq.m Site office	See Scope of work	1	set	850,000.00	850,000.00
2C7-2	Architectural and Civil engineering design work	-	Lump Sum	Lump Sum	287,335.22	287,335.22
2C7-3	Fire Protection design work		Lump sum	Lump sum	55,836.00	55,836.00
2C7-4	Dynamic Pile load test		Lump Sum	Lump Sum	120,000.00	120,000.00
2C7-5	Static pile load test		1	set	179,350.00	179,350.00
Total Price for Schedule 2C7					Baht 1,492,521.22	


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MEDIUM COST FOR BID NO. TS12-S-26(R)

2C8 : Miscellaneous

SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C8-1	Wire mesh fence and gate (Pile type)	SD-CF-0-01 See Dwg. BBG2-C-1	Lump Sum	Lump Sum	895,400.00	895,400.00
2C8-2	Wire mesh fence 1.50 m high(Pad type)	SD-CF-0-03 See Dwg. BBG2-C-1	Lump Sum	Lump Sum	724,138.80	724,138.80
2C8-3	Switchyard Entrance Gate (sliding gate)	SD-SG-0-02 See Dwg. BBG2-C-1	1	set	291,023.70	291,023.70
2C8-4	Main Entrance Gate 8.00m width (sliding gate with remote control, door phone and CCTV system)	SD-SG-0-03 See Dwg. BBG2-C-1	1	set	431,817.10	431,817.10
2C8-5	Guard house	HS-GH-0-02 See Dwg. BBG2-C-1	1	set	446,749.60	446,749.60
2C8-6	Standard symbol and sign letters of substation	TP.655A-MS-A See Dwg. BBG2-C-1	1	set	652,560.70	652,560.70

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MEDIUM COST FOR BID NO. TS12-S-26(R)

2C8 : Miscellaneous

SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C8-7	Sign Board Structure & foundation	SD-SB-0-08 See Dwg. BBG2-C-1	1	set	178,700.50	178,700.50
2C8-8	Flag Pole (15.00m)	SD-FP-0-02 See Dwg. BBG2-C-1	1	set	231,942.70	231,942.70
2C8-9	PC. or RC. Pile sq. 0.18 * 0.18 m (Dowel bar, Pile cut off and Pile shoe are included)	SD-PL-0-01	Lump Sum	Lump Sum	593,571.44	593,571.44
2C8-10	Bored hole for soil investigation 15 m depth/hole	See Dwg. BBG2-C-1	6	set	13,769.80	82,618.80
2C8-11	Reinforcement of standard handhole	SD-HH-0-01 See Dwg. BBG2-C-1	10	set	7,344.70	73,447.00
Total Price for Schedule 2C8					Baht	4,601,970.34

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MEDIUM COST FOR BID NO. TS12-S-26(R)
2C9 : Fire Protection System
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C9-1	Fire Protection System for 115 kV GIS Building (please give detail and breakdown)	Designed by Contractor	Lump Sum	Lump Sum	2,538,000.00	2,538,000.00
Total Price for Schedule 2C9					Baht 2,538,000.00	




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MEDIUM COST FOR BID NO. TS12-S-26(R)
2D7 : Spare Parts for SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
2D7-1	Gas density meter with two-stage contacts for circuit breaker compartment spare parts for GIS	1	set	THB	30,432.00	30,432.00			XXXXX	XXXXX		
2D7-2	Gas density meter for other compartment spare parts for GIS	1	set	THB	59,819.00	59,819.00			XXXXX	XXXXX		
2D7-3	Rupture disc of overpressure protection device spare parts for GIS (1EA for each type/each operating pressure)	1	set	THB	23,535.00	23,535.00			XXXXX	XXXXX		
2D7-4	Pump with motor for hydraulic spare parts for GIS (if any)	1	set	THB	51,773.00	51,773.00			XXXXX	XXXXX		
2D7-5	Maintenance closing device for circuit breaker	1	set	THB	42,430.00	42,430.00			XXXXX	XXXXX		
2D7-6	SF6 gas filling cart accessories for GIS	1	set	THB	191,891.00	191,891.00			XXXXX	XXXXX		
2D7-7	Operating Analyzer Fitting Means accessories for GIS	1	set	THB	211,474.00	211,474.00			XXXXX	XXXXX		
2D7-8	Hand pump for hydraulic accessories for GIS (if any)	1	set	THB	517,767.00	517,767.00			XXXXX	XXXXX		


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MEDIUM COST FOR BID NO. TS12-S-26(R)
2D7 : Spare Parts for SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
2D7-9	Loose pressure gauge completed with necessary fitting for circuit breaker compartment accessories for GIS (3 phases set precision pressure gauge spare parts for GIS, can be combined with Gas density meter for CB compartment)	1	set	THB	included	included			XXXXX	XXXXX		
2D7-10	Cost of Local Transportation for Item No. 2D7-1 thru 2D7-9	Lump sum	Lump sum	THB	XXXXXX	XXXXXX	XXXXXX	XXXXXX	56,456.05	56,456.05		
Total Price for Schedule 2D7				THB	1,129,121.00		Baht		56,456.05			

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MEDIUM COST FOR BID NO. TS12-S-26(R)
2D22 : Spare Parts for Grounding Material
SUPPLY AND CONSTRUCTION OF 115 KV BAN BUENG 2 SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
2D22-1	Portable temporary grounding tools for maintenance as per Specification attached	1	set	THB	476,315.20	476,315.20			XXXXXX	XXXXXX		
2D22-2	Cost of Local Transportation for Item No 2D22-1	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	23,815.76	23,815.76		
Total Price for Schedule 2D22				THB	476,315.20		Baht		Baht 23,815.76			

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INVITATION TO BID NO. TS12-S-26(R)
3AB2 : Distribution Transformer
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB2-1	250 kVA, 22000-400/230V distribution transformer, oil immersed, outdoor type as per Ratings and Features RF DX2604	2		THB			616,000.00	1,232,000.00	XXXXXX	XXXXXX		
3AB2-2	100 kVA, 400-400/230V distribution transformer, oil immersed, outdoor type as per Ratings and Features RF DX0306	1		THB			414,000.00	414,000.00	XXXXXX	XXXXXX		
3AB2-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB2-1 thru 3AB2-2		Lumpsum	Lumpsum	THB	XXXXXX	XXXXXX	XXXXXX	XXXXXX	197,520.00	197,520.00	
Total Price for Schedule 3AB2				THB			Baht 1,646,000.00		Baht 197,520.00			

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INVITATION TO BID NO. TS12-S-26(R)
3AB5 : Current Transformer and Junction Box
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB5-1	115 kV CT, 550 kV BIL, 100/-/1200:5//5//5//5 A, 40 kA, oil filled as per Rating and Features RF CT75E6	3		THB	190,000.00	570,000.00			XXXXX	XXXXX		
3AB5-2	115 kV CT, 550 kV BIL, 300/-/2000:5//5//5//5 A, 40 kA, oil filled as per Rating and Features RF CT78E8	6		THB	190,000.00	1,140,000.00			XXXXX	XXXXX		
3AB5-3	Steel Supporting Structure for CT75E6 (for item no.3AB5-1), H = 4.50 m. as per Dwg. No. ST-CT-4-01 and SD-AB-0-01	3		THB			52,000.00	156,000.00	XXXXX	XXXXX		
3AB5-4	Steel Supporting Structure for CT78E8 (for item no.3AB5-2), H = 4.50 m. as per Dwg. No. ST-CT-4-01 and SD-AB-0-01	6		THB			52,000.00	312,000.00	XXXXX	XXXXX		
3AB5-5	Junction Box type CT1 (for Item No. 3AB5-1 and 3AB5-2) as per Dwg. No. TP-E-18.2 and TP-E-18.4	3		THB			36,000.00	108,000.00	XXXXX	XXXXX		
3AB5-6	Cost of Local Transportation, Construction and Installation for Item No. 3AB5-1 thru 3AB5-5		Lumpsum	THB	XXXXX	XXXXX	XXXXX	XXXXX	274,320.00	274,320.00		
Total Price for Schedule 3AB5				THB	1,710,000.00		Baht		Baht			
							576,000.00		274,320.00			


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INVITATION TO BID NO. TS12-S-26(R)
3AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB6-1	Junction Box type PT-D1 as per Dwg. No. TP-E-20.7-1/3, 2/3 and 3/3	4		THB			21,000.00	84,000.00	XXXXX	XXXXX		
3AB6-2	Junction Box type PT-D2 as per Dwg. No. TP-E-20.7-1/3, 2/3 and 3/3	2		THB			26,000.00	52,000.00	XXXXX	XXXXX		
3AB6-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB6-1 thru 3AB6-2	Lumpsum	Lumpsum	THB	XXXXX	XXXXX	XXXXX	XXXXX	16,320.00	16,320.00		
				THB			Baht		Baht			
Total Price for Schedule 3AB6							136,000.00		16,320.00			



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INVITATION TO BID NO. TS12-S-26(R)
3AB11 : Power Fuse, Fuse Link and Hook Stick
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB11-1	22 kV 100 A 12.5 kA 1-pole dropout fuse as per Ratings and Features RF PF2111 (Not including fuse link or refill unit)	6		THB	170,974.10	1,025,844.60			XXXXX	XXXXX		
3AB11-2	Fuse link or refill unit 20E for 22 kV power fuse (Standard Speed)	6		THB	15,478.10	92,868.60			XXXXX	XXXXX		
3AB11-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB11-1 thru 3AB11-2											
		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	134,245.58	134,245.58		
Total Price for Schedule 3AB11				THB	1,118,713.20		Baht		Baht 134,245.58			


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INVITATION TO BID NO. TS12-S-26(R)
3AB12 : AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB12-1	Lighting Relay Panel (LRP) as per Dwg. No. LT-RP-0-03	1					92,148.00	92,148.00	XXXXX	XXXXX		
3AB12-2	Safety switch 600 Vac 400 A, 4 wire, solid neutral (S/N), 3 blades, 3 fuses time lag type, outdoor NEMA 4X enclosure or higher, completed with 400 A fuses.	2					84,710.00	169,420.00	XXXXX	XXXXX		
3AB12-3	Automatic transfer switch board as per Dwg. No. SE-ATS-7-03 (Design by Contractor, supply and modification of ATS for KWh meter installation, see dwg. No. BBG-L-5-01/01 for guideline)	1					600,548.00	600,548.00	XXXXX	XXXXX		
3AB12-4	Termination Box type TB1 as per Dwg No. LT-TB-0-01	7					3,236.00	22,652.00	XXXXX	XXXXX		
3AB12-5	Outdoor Receptacle Box type ORB1 as per Dwg. No. SE-ORB-0-01	1					22,965.00	22,965.00	XXXXX	XXXXX		
3AB12-6	Outdoor Receptacle Box type ORB3 as per Dwg. No. SE-ORB-0-01	1					42,109.00	42,109.00	XXXXX	XXXXX		
3AB12-7	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4	1					195,405.00	195,405.00	XXXXX	XXXXX		
3AB12-8	125 Vdc Power Panel as per Dwg. No. TP-E-4.4	1					156,690.00	156,690.00	XXXXX	XXXXX		

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INVITATION TO BID NO. TS12-S-26(R)
3AB12 : AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB12-9	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4	2						148,305.00	296,610.00	XXXXXX	XXXXXX	
3AB12-10	Cost of Local Transportation, Construction and Installation for Item No. 3AB12-1 thru 3AB12-9	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	191,825.64	191,825.64	
Total Price for Schedule 3AB12								Baht 1,598,547.00		Baht 191,825.64		


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INVITATION TO BID NO. TS12-S-26(R)
3AB13 : Stationary Battery and Battery Charger
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
3AB13-1	Vented stationary battery, 58 cells (tubular type) for 125 Vdc system complete with electrolyte and battery rack as per Specification attached (Designed by Contractor)											
3AB13-1a	a) Battery	1	set	THB	745,800.00	745,800.00			XXXXXX	XXXXXX		
3AB13-1b	b) Electrolyte	1	set	THB	24,115.21	24,115.21			XXXXXX	XXXXXX		
3AB13-1c	c) Battery Rack	1	set	THB	51,675.45	51,675.45			XXXXXX	XXXXXX		
3AB13-2	125 Vdc battery charger having sufficient rated DC output current, but not less than 15 % of associated battery 8 hour drainage rate, complete with all accessories as per Specification attached, and shall be suitable for use with substation battery Item No. 3AB13-1	1					392,700.00	392,700.00	XXXXXX	XXXXXX		
3AB13-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB13-1 thru 3AB13-2								145,714.88	145,714.88		
				Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
Total Price for Schedule 3AB13							821,590.66	Baht	392,700.00	Baht		
										145,714.88		


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INVITATION TO BID NO. TS12-S-26(R)
3AB14 : Substation Steel Structure
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB14-1	6.0 m self support telecommunication tower on the roof of control building as per Dwg. No. ST-TT-0-05	1						75,139.07	75,139.07	XXXXX	XXXXX	
3AB14-2	Junction box support structure (JB003) as per Dwg. No. ST-JB-0-03	2						8,515.76	17,031.52	XXXXX	XXXXX	
3AB14-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB14-1 thru 3AB14-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	27,651.18	27,651.18	
Total Price for Schedule 3AB14								Baht 92,170.59		Baht 27,651.18		


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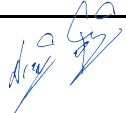

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INVITATION TO BID NO. TS12-S-26(R)
3AB18 : Low Voltage Cable and Conductor
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum				5,759,281.00	5,759,281.00	XXXXXX	XXXXXX		
3AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum				837,595.00	837,595.00	XXXXXX	XXXXXX		
3AB18-3	750 V lighting cable (THW) as per Specification attached	Lump sum	Lump sum				38,500.00	38,500.00	XXXXXX	XXXXXX		
3AB18-4	750 V lighting cable (NYY) as per Specification attached	Lump sum	Lump sum				509,795.00	509,795.00	XXXXXX	XXXXXX		
3AB18-5	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				767,992.50	767,992.50	XXXXXX	XXXXXX		
3AB18-6	Aluminum conductor as per Specification attached	Lump sum	Lump sum				29,942.00	29,942.00	XXXXXX	XXXXXX		
3AB18-7	Cost of Local Transportation, Construction and Installation for Item No. 3AB18-1 thru 3AB18-6	Lump sum	Lump sum			XXXXXX	XXXXXX	XXXXXX	XXXXXX	2,382,931.65	2,382,931.65	
Total Price for Schedule 3AB18								Baht 7,943,105.50	Baht 2,382,931.65			



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INVITATION TO BID NO. TS12-S-26(R)
3AB19 : Switchyard Lighting Fixtures
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB19-1	Flood lighting fixture, LED lamp, 10000 lumen, wide-beam, complete with control gear as per Specification attached	4						13,505.80	54,023.20	XXXXXX	XXXXXX	
3AB19-2	Street lighting fixture, LED lamp, 5000 lumen, wide beam, complete with control gear as per Specification attached	26						13,505.80	351,150.80	XXXXXX	XXXXXX	
3AB19-3	Tapered galvanized steel lamp post H=5000 mm. complete with 2 A 250 V plug fuse, 20 A 500 V terminal block for accepting 4 sq.mm. of incoming and outgoing cables and anchor bolts as per Dwg. No. ST-LP-0-03 and SD-AB-0-01	13						20,829.60	270,784.80	XXXXXX	XXXXXX	
3AB19-4	Cost of Local Transportation, Construction and Installation for Item No. 3AB19-1 thru 3AB19-3	Lump sum	Lump sum					XXXXXX	XXXXXX	XXXXXX	XXXXXX	
Total Price for Schedule 3AB19								Baht 675,958.80		Baht 202,787.64		



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INVITATION TO BID NO. TS12-S-26(R)
3AB20 : Aluminum Tube, Connector and Miscellaneous Hardware
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB20-1	115 kV and below Compression connector as per Specification attached	Lump sum	Lump sum				20,350.00	20,350.00	XXXXXX	XXXXXX		
3AB20-2	115 kV and below Miscellaneous hardware as per Specification attached	Lump sum	Lump sum				17,693.50	17,693.50	XXXXXX	XXXXXX		
3AB20-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB20-1 thru 3AB20-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	11,413.05	11,413.05		
Total Price for Schedule 3AB20								Baht 38,043.50	Baht 11,413.05			


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INVITATION TO BID NO. TS12-S-26(R)
3AB21 : Bus Fitting
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB21-1	115 kV and below Bus fitting as per Specification attached			THB	111,207.72	111,207.72			XXXXXX	XXXXXX		
3AB21-2	Cost of Local Transportation, Construction and Installation for Item No. 3AB21-1				XXXXXX	XXXXXX	XXXXXX	XXXXXX	33,362.32	33,362.32		
				THB	111,207.72		Baht		Baht			
Total Price for Schedule 3AB21									33,362.32			

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INVITATION TO BID NO. TS12-S-26(R)
3AB22 : Grounding Material
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	48,721.68	48,721.68			XXXXX	XXXXX		
3AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				207,715.68	207,715.68	XXXXX	XXXXX		
3AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	147,320.62	147,320.62			XXXXX	XXXXX		
3AB22-4	Cost of Local Transportation, Construction and Installation for Item No. 3AB22-1 thru 3AB22-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	121,127.39	121,127.39		
Total Price for Schedule 3AB22				THB	196,042.30		Baht	207,715.68		Baht	121,127.39	

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INVITATION TO BID NO. TS12-S-26(R)
3AB23 : Substation Miscellaneous
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB23-1	Rigid steel conduit as per Specification attached	Lump sum	Lump sum				157,357.20	157,357.20	XXXXX	XXXXX		
3AB23-2	Fitting for rigid steel conduit as per Specification attached	Lump sum	Lump sum	THB	88,393.80	88,393.80			XXXXX	XXXXX		
3AB23-3	HDPE conduit and fitting as per Specification attached	Lump sum	Lump sum				3,672.00	3,672.00	XXXXX	XXXXX		
3AB23-4	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum				67,003.20	67,003.20	XXXXX	XXXXX		
3AB23-5	Heat shrinkable insulation material	Lump sum	Lump sum	THB	90,687.96	90,687.96			XXXXX	XXXXX		
3AB23-6	Cost of Local Transportation, Construction and Installation for Item No. 3AB23-1 thru 3AB23-5	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	122,134.25	122,134.25		
Total Price for Schedule 3AB23				THB	179,081.76		Baht	228,032.40		Baht	122,134.25	

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INVITATION TO BID NO. TS12-S-26(R)
3AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
3AB24-1	DSS : Digital Substation System including System Integrator	-See Bill of Materials for 3AB24-1 -See Scope of Work -Specification No. 1008 -DRAWING NOS. BBG-E-1, TP-E-20.3	1	SET				91,534,736.00	91,534,736.00	XXXXX	XXXXX		
3AB24-2	EGAT-PEA INTERFACING PANEL(2-REMOTE I/O AND ACCESSORIES)	-Panel No. EGAT-PEA Interfacing -See Scope of Work -Drawing Nos. BBG-E-1	1	EA				610,489.00	610,489.00	XXXXX	XXXXX		



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3AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
3AB24-3	36 Cores Non-metallic Optical Fiber Cable	-See Scope of Work -Drawing Nos. DW-FOT-D01-202-02 SH.P9&P11 and DW-FOT-D01-215-01 SH.P2 -See Spec.No. SD-FOT-P22 -The length of OFC that connects between joint box at take-off structure and FTC in EGAT-PEA Interfacing Panel at Control Building shall conform to Drawing Nos BBG-S-2, BBG-S-6 and BBG-S-7	1	LOT				16,800.00	16,800.00	XXXXX	XXXXX		


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3AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
3AB24-4	6-WIRE CLEAT FOR COILING OPTICAL FIBER CABLE	-See Scope of Work -Drawing Nos. DW-FOT-D01-202-02 SH.P9&P11 -See Spec. No. SD-FOT-P22	1	SET				9,420.00	9,420.00	XXXXX	XXXXX		
3AB24-5	EFLEX AND/OR HDPE CONDUIT WITH HOT-DIP GALVANIZED STEEL CLAMP	-See Scope of Work -Drawing Nos. DW-FOT-D01-202-02 SH.P9&P11 -Supplied with Hot-Dip Galvanized Steel Clamp 1 Set per 1 Meter of Conduit -See Spec. No. SD-FOT-P22 -The length of Conduit shall conform to Drawing Nos. BBG-2, BBG-S-6 and BBG-S-7	1	LOT				21,760.00	21,760.00	XXXXX	XXXXX		



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INVITATION TO BID NO. TS12-S-26(R)
3AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		Unit Price	Amount
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB24-6	RIGID STEEL CONDUIT	-See Scope of Work -Drawing Nos. DW-FOT-D01-202-02 SH.P9&P11 -See Spec.No. SD-FOT-P22 The length of RSC from joint box at take-off structure to cable trench shall conform to Drawing BBG-S-2, BBG-S-6 and BBG-S-7	1	LOT				6,430.00	6,430.00	XXXXX	XXXXX		
3AB24-7	2-Way Joint Boxes with Accessories for OPGW and 36 Cores Non-metallic Optical Fiber Cable	-Installed at take-off structure -See Scope of Work -Drawing Nos. DW-FOT-D01-202-02 SH.P9&P11 -See Spec. No. SD-FOT-P22	1	EA				11,816.00	11,816.00	XXXXX	XXXXX		


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INVITATION TO BID NO. TS12-S-26(R)
3AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB24-8	Cost of Local Transportation, Construction and Installation for Item No. 3AB24-1 thru. 3AB24-7												
			Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	11,037,090.00	11,037,090.00		
Total Price for Schedule 3AB24								Baht	92,211,451.00	Baht	11,037,090.00		


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INVITATION TO BID NO. TS12-S-26(R)
3AB25 : Fault Recording System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		Unit Price	Amount
						CIF Thai Port		Unit Price	Amount				
						Unit Price	Amount			Unit Price	Amount		
3AB25-1	DSS : Fault Recording System	-See Bill of Materials for 3AB25-1 -See Scope of Work -Specification Ref 1003, 1008 -DRAWING NOs. BBG-E-1	1	SET					3,177,296.00	3,177,296.00	XXXXX	XXXXX	
3AB25-2	Cost of Local Transportation, Construction and Installation for Item No.3AB25-1		Lump sum	Lump sum			XXXXX	XXXXX	XXXXX	XXXXX	337,055.00	337,055.00	
Total Price for Schedule 3AB25									Baht	3,177,296.00	Baht	337,055.00	



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INVITATION TO BID NO. TS12-S-26(R)
3AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power Panel
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB34-1	Vented Type Lead-Acid Station Battery 48VDC with capacity not less than 400Ah (Tubular plate) at 10 Hour rated, 24 Cells, Nominal Voltage 2 Volt/Cell, with Rack 1 set (New Control Building at Ban Bueng Substation)	1	SET	THB	137,200.00	137,200.00			XXXXXX	XXXXXX		
3AB34-2	Conventional Type Charger 48VDC, 100A (New Control Building at Ban Bueng Substation)	2	SET				202,100.00	404,200.00	XXXXXX	XXXXXX		
3AB34-3	48VDC Load center Type1: 60 Breaker (New Control Building at Ban Bueng Substation)	1	SET				137,500.00	137,500.00	XXXXXX	XXXXXX		
3AB34-4	Local Transportation, Construction and Installation for item 3AB34-1, 3AB34-2 and 3AB34-3	1	JOB		XXXXXX	XXXXXX	XXXXXX	XXXXXX	66,200.00	66,200.00		
Total Price for Schedule 3AB34				THB	137,200.00		Baht		Baht			
							541,700.00		66,200.00			


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INVITATION TO BID NO. TS12-S-26(R)
3AB35 : Communication Cable
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB35-1	Optical Fiber Cable from fiber frame termination cabinet at Ban Bueng new control building to 2-way joint box at 115 kV to Ban Bueng 2 take-off structure											
3AB35-1.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 150 meter) (b) Rigid steel conduit from take-off structure to cable trench (lump sum) (c) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (d) Rack cabinet and accessories (Ban Bueng new control building - 1 set) (e) Fiber frame termination cabinet with cable tray (Ban Bueng new control building - 1 set) (f) 36 pigtails (1.5 meter) (Ban Bueng new control building - 1 set) (g) 6-wire cleat for coiling optical fiber cable at take-off structure (4 set)	1	LOT					93,900.00	93,900.00	XXXXXX	XXXXXX	


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INVITATION TO BID NO. TS12-S-26(R)
3AB35 : Communication Cable
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB35-1.2	Local transportation, Construction and Installation for item 3AB35-1.1 (including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	63,000.00	63,000.00		
3AB35-2 3AB35-2.1	Temporary Optical Fiber Cable from fiber frame termination cabinet at Ban Bueng new control building to fiber frame termination cabinet at Ban Bueng existing control building Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 250 meter) (b) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (c) Fiber frame termination cabinet with cable tray (Ban Bueng new control building - 2 set, Ban Bueng existing control building - 2 set)	1	LOT				104,400.00	104,400.00	XXXXX	XXXXX		



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INVITATION TO BID NO. TS12-S-26(R)
3AB35 : Communication Cable
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB35-2.2	Local transportation, Construction and Installation for item 3AB35-2.1 (including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	105,000.00	105,000.00		
	<p>IMPORTANT:</p> <p>1. Telecommunication Equipment supplied under Schedule AB35 shall conform to Telecommunication Equipment Specification: Single Sheath Non-metallic Optical Fiber Cable (SD-FOT-P22).</p> <p>2. The Bidder shall be required to later break down the unit price for sub-items of this schedule for consideration.</p>											
Total Price for Schedule 3AB35									Baht 198,300.00	Baht 168,000.00		



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INVITATION TO BID NO. TS12-S-26(R)
3AB39 : Commissioning
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	243,000.00	243,000.00		
Total Price for Schedule 3AB39							Baht		Baht 243,000.00			


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INVITATION TO BID NO. TS12-S-26(R)
3AB40 : Installation of Equipment and Steel Structure Supplied by EGAT
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB40-1	Dismantlement of Existing Equipment											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	581,547.70	581,547.70		
Total Price for Schedule 3AB40									Baht	581,547.70		

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INVITATION TO BID NO. TS12-S-26(R)

3C1 : Foundation Work

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12**

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Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C1-1	115/230 kV General equipment support structure foundation (BP701,BP801,CC704,CT702,CT802,VT703,VT803, LA401, LA402, LA801, LA802) Pad Type(CT702)	FD-GE-0-01	3	set	14,355.00	43,065.00
3C1-2	Lighting Relay Panel foundation (RP002) Pad Type	FD-RP-0-03	1	set	6,851.90	6,851.90
3C1-3	Lamp post for fence and access road lighting foudation (LP3) (LED type) Pad Type & Pile Type	FD-LP-0-05	6	set	10,967.00	65,802.00
3C1-4	Isolating Transformer Foundation (IST) Pad Type	FD-TX-0-01	1	set	22,918.50	22,918.50
3C1-5	Outdoor merging unit structure foundation (MU001) Pad Type	FD-MU-0-01	17	set	10,547.90	179,314.30
3C1-6	Fire Wall 8.00m Height (FW) Pad Type	FD-FW-0-01	1	set	619,725.70	619,725.70
3C1-7	Neutral Reactor Support Structure foundation (NGR) Pad Type	FD-NGR-7-01	2	set	18,987.10	37,974.20
3C1-8	Outdoor marshalling Cubicle foundation (MC002) Pad Type	FD-MC-0-06	2	set	4,705.80	9,411.60

INVITATION TO BID NO. TS12-S-26(R)
3C1 : Foundation Work
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C1-9	Junction Box Structure foundation (JB003) Pad Type	FD-JB-0-05	2	set	7,415.10	14,830.20
3C1-10	115 kV Current Transformer foundation (CT701) Pad Type (Existing to be removed)	G04/FD-CT-7-01	3	set	7,440.40	22,321.20
3C1-11	Neutral Reactor Support Structure foundation (NGR) (Existing to be removed)	FD-NGR-7-01	2	set	7,595.50	15,191.00
3C1-12	Outdoor marshalling Cubicle foundation (MC002) Pad Type (Existing to be removed)	FD-MC-0-03	2	set	1,883.20	3,766.40
3C1-13	115 kV Bus pole support structure foundation (BP 701) Pad Type (Existing to be removed)	FD-BP-7-01	6	set	6,296.40	37,778.40
3C1-14	115 kV Disconnecting Switch Support foundation (DS704) Pad Type (Existing to be removed)	FD-DS-7-07	2	set	14,030.50	28,061.00
Total Price for Schedule 3C1					Baht	1,107,011.40

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INVITATION TO BID NO. TS12-S-26(R)
3C2 : Cable Trench
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C2-1	Cable ladder 0.60m width type CLE (for transformer)	Designed by Contractor See Dwg.No.BBG-C-3	Lump Sum	Lump Sum	25,753.20	25,753.20
3C2-2	Standard cable trench, steel cover included (Type"A")	SD-CE-0-02 See Dwg.No.BBG-C-3	Lump Sum	Lump Sum	292,331.82	292,331.82
3C2-3	Standard cable trench, steel cover included (Type"B")	SD-CE-0-02 See Dwg.No.BBG-C-3	Lump Sum	Lump Sum	162,729.60	162,729.60
3C2-4	Standard cable trench, steel cover included (Type"A")(Existing to be removed)	SD-CE-0-02 See Dwg.No.BBG-C-3	Lump Sum	Lump Sum	101,609.86	101,609.86
Total Price for Schedule 3C2					Baht	582,424.48


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INVITATION TO BID NO. TS12-S-26(R)
3C3 : Building
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C3-1	230/115 kV Control Building	Designed by Contractor SU1-CD-7-03A See Dwg.No.BBG-C-3 See Scope of work	Lump Sum	Lump Sum	23,015,976.06	23,015,976.06
3C3-1.1	Air conditioning system and Ventilation system					
3C3-1.1.1	Minimum 40,000 BTU split-type air conditioner, including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		2	set	66,918.50	133,837.00
3C3-1.1.2	Minimum 48,000 BTU split-type air conditioner, including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		8	set	69,664.10	557,312.80
3C3-1.1.3	Extra work for air conditioning system		Lump Sum	Lump Sum		
3C3-1.1.4	Ventilation system		Lump Sum	Lump Sum		
Total Price for Schedule 3C3					Baht	23,707,125.86

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INVITATION TO BID NO. TS12-S-26(R)
3C4 : Earth Work, Road and Crushed Rock Surfacing
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C4-1	RC.Road type " E " section 6 - 6 (6.00,4.00 m (width))	SD-RD-0-01 See Dwg. BBG-C-6	Lump Sum	Lump Sum	1,267,310.00	1,267,310.00
3C4-2	Transformer loading	SD-RD-0-03 See Dwg. BBG-C-6	Lump Sum	Lump Sum	305,672.40	305,672.40
3C4-3	Crushed rock surfacing 0.10 m thickness	See Dwg. BBG-C-1	Lump Sum	Lump Sum	81,615.38	81,615.38
Total Price for Schedule 3C4					Baht 1,654,597.78	


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INVITATION TO BID NO. TS12-S-26(R)
3C5 : Water Supply System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C5-1	Water supply system	Designed by Contractor See Scope of work See Dwg.BBG-C-9	Lump Sum	Lump Sum	17,872.80	17,872.80
3C5-2	Water storage tank capacity 2,000 liters, Polyethylene type	Designed by Contractor	1	set	18,360.10	18,360.10
3C5-3	Automatic Pump with pressure tank	Designed by Contractor	1	set	18,360.10	18,360.10
Total Price for Schedule 3C5					Baht 54,593.00	



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INVITATION TO BID NO. TS12-S-26(R)
3C6 : Drainage System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C6-1	Drainage System	Designed by Contractor See Scope of work See Dwg.BBG-C-6	Lump Sum	Lump Sum	6,119,916.66	6,119,916.66
3C6-2	Oil separator (Pile type)	SD-OS-0-02	1	set	1,165,220.10	1,165,220.10
3C6-3	Oil pit with steel grating (fot T-300)	WD-DN-0-04	44	m	20,807.60	915,534.40
3C6-4	Exiting to be removed drainage system	See Scope of work See Dwg.BBG-C-6	Lump Sum	Lump Sum	159,859.70	159,859.70
Total Price for Schedule 3C6					Baht 8,360,530.86	



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INVITATION TO BID NO. TS12-S-26(R)
3C7 : Special Construction Works
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C7-1	Test and commissioning for inert gas system (Test in control room)		1	set	70,000.00	70,000.00
3C7-2	Architectural and Civil engineering design work		Lump Sum	Lump Sum	374,529.85	374,529.85
3C7-3	Fire Protection design work		Lump sum	Lump sum	116,223.80	116,223.80
3C7-4	Dynamic Pile load test		Lump Sum	Lump Sum	90,000.00	90,000.00
3C7-5	Static pile load test		1	set	179,350.00	179,350.00
3C7-6	Plate bearing test	See Dwg. BBG-C-1	3	set	20,000.00	60,000.00
Total Price for Schedule 3C7					Baht 890,103.65	

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INVITATION TO BID NO. TS12-S-26(R)
3C8 : Miscellaneous
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C8-1	Wire mesh fence and gate (Pad type)	SD-CF-0-01 See Dwg. BBG-C-1	Lump Sum	Lump Sum	487,993.00	487,993.00
3C8-2	Switchyard Entrance Gate (sliding gate)	SD-SG-0-02 See Dwg. BBG-C-1	1	set	291,023.70	291,023.70
3C8-3	Bored hole for soil investigation 15 m depth/hole	See Dwg. BBG-C-1	3	set	13,769.80	41,309.40
3C8-4	Flag Pole (15.00m)	SD-FP-0-02 See Dwg. BBG-C-1	1	set	231,942.70	231,942.70
3C8-5	Exiting to be removed Flag Pole(15.00m)	SD-FP-0-02 See Dwg. BBG-C-1	1	set	92,777.30	92,777.30
Total Price for Schedule 3C8					Baht 1,145,046.10	



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INVITATION TO BID NO. TS12-S-26(R)
3C9 : Fire Protection System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C9-1	Fire Protection System for 115kV Control Building	Designed by Contractor	lump sum	lump sum	3,802,900.00	3,802,900.00
3C9-2	Fire Protection environmental monitoring system	Designed by Contractor	lump sum	lump sum	1,480,000.00	1,480,000.00
3C9-3	Wheel fire extinguisher (1*50 lbs)		6	set	78,513.00	471,078.00
3C9-4	Cabinet for Wheel fire extinguisher	HS-WR-0-04	3	set	67,297.00	201,891.00
Total Price for Schedule 3C9					Baht 5,955,869.00	

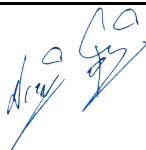

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INVITATION TO BID NO. TS12-S-26(R)
3D11 : Spare Parts for Power Fuse, Fuse Link and Hook Stick
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
3D11-1	Fuse link or refill unit 20E for 22 kV power fuse (Standard Speed)	6		THB	15,478.10	92,868.60			XXXXXX	XXXXXX		
3D11-2	6.10 m. (20 ft.) hook stick, (14 ft universal with male pin and 6 ft pole extention with female pin) for use with the power fuse	1		THB	32,418.10	32,418.10			XXXXXX	XXXXXX		
3D11-3	Cost of Local Transportation for Item No. 3D11-1 thru 3D11-2											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	6,264.34	6,264.34		
Total Price for Schedule 3D11				THB	125,286.70		Baht		6,264.34			



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INVITATION TO BID NO. TS12-S-26(R)
3D12 : Spare Parts for AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
3D12-1	Fuse time lag type 400 A	6					4,773.00	28,638.00	XXXXXX	XXXXXX		
3D12-2	Cost of Local Transportation for Item No. 3D12-1	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	1,431.90	1,431.90		
Total Price for Schedule 3D12									Baht	28,638.00	Baht	1,431.90



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INVITATION TO BID NO TS12-S-26(R)
3D22 : Spare Parts for Grounding Material
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
3D22-1	Portable temporary grounding tools for maintenance as per Specification attached	1	set	THB	476,315.20	476,315.20			XXXXX	XXXXX
3D22-2	Cost of Local Transportation for Item No 3D22-1				XXXXX	XXXXX	XXXXX	XXXXX	23,815.76	23,815.76
				THB	476,315.20		Baht		Baht	
Total Price for Schedule 3D22									23,815.76	



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INVITATION TO BID NO. TS12-S-26(R)
3D24 : Spare Parts for Control and Protection System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht				
						Foreign Supply		Local Supply						
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount	
						Unit Price	Amount	Unit Price	Amount					
3D24-1	DSS : Spare Parts	-See Bill of Materials for 3D24-1 -Specification No. 1008	1	Set					9,672,434.00	9,672,434.00	XXXXX	XXXXX		
3D24-2	Cost of Local Transportation for Item No. 3D24-1										37,889.00	37,889.00		
Total Price for Schedule 3D24											Baht	9,672,434.00	Baht	37,889.00



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INVITATION TO BID NO. TS12-S-26(R)
3D25 : Spare Parts for Fault Recording System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 115 KV BAN BUENG SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht					
						Foreign Supply		Local Supply							
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount						
3D25-1	DSS : Digital Fault Recorder Equipment	-Spare DFR equipment is same ordering number as supplied in schedule 3AB25 -Specification Nos. 1003, and 1008	1	Ea				847,556.00	847,556.00	XXXXXX	XXXXXX				
3D25-2	Cost of Local Transportation for Item No. 3D25-1		Lump sum	Lump sum			XXXXXX	XXXXXX	XXXXXX	XXXXXX	11,016.00	11,016.00			
Total Price for Schedule 3D25										Baht	Baht	847,556.00	11,016.00		



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INVITATION TO BID NO. TS12-S-26(R)
4E24 : Control and Protection System
SUPPLY OF CONTROL AND PROTECTION EQUIPMENT FOR 230 KV BO WIN SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
4E24-1	Multi-function Protective IED (87L,21BU,67/67N, 81, 27, 50BF, 79, 25, 51S/51SG)	- Supply as Loose Part for Installation at BWN Substation - IED shall include both I/O Modules (Binary Input, Binary Output, and Analog Input) and four (4) ports of Ethernet (IEC61850 Ed2 Standard with PRP). - Secondary Current Input Rating : 5A - Specification No. 1008 - Same Type as Supplied in Item No. 1AB24-1 (Item no.3 in Bill of Materials for Item No. 1AB24-1)	2	EA				845,693.00	1,691,386.00	XXXXXX	XXXXXX		



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INVITATION TO BID NO. TS12-S-26(R)
4E24 : Control and Protection System
SUPPLY OF CONTROL AND PROTECTION EQUIPMENT FOR 230 KV BO WIN SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
4E24-2	E1 CONVERTER	- 2 set of Multimode Patch Cord Cable and 2 set 30m of Coaxial Cable (RG179) shall be supplied in each E1 Converter. - Specification No. 1008 - Same Type as Supplied in Item No. 1AB24-1 (Item no.27 in Bill of Materials for Item No. 1AB24-1)	2	SET				159,028.00	318,056.00	XXXXXX	XXXXXX		



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INVITATION TO BID NO. TS12-S-26(R)
4E24 : Control and Protection System
SUPPLY OF CONTROL AND PROTECTION EQUIPMENT FOR 230 KV BO WIN SUBSTATION
TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply		(excluding VAT) Baht	
						CIF Thai Port		Ex-works Price			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
4E24-3	Multi-function Protective IED (87L,21BU,67/67N, 81, 27, 50BF, 79, 25, 51S/51SG)	- Supply as Spare Part for Item No.4E24-1 - Same Type as Supplied in Item No. 4E24-1	1	EA			845,693.00	845,693.00	XXXXX	XXXXX	
4E24-4	E1 CONVERTER	- Supply as Spare Part for Item No.4E24-2 - Same Type as Supplied in Item No. 4E24-2	1	SET			159,028.00	159,028.00	XXXXX	XXXXX	
4E24-5	Cost of local Transportation for Item No. 4E24-1 thru 4E24-4		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	17,613.00	17,613.00
Total Price for Schedule 4E24								Baht 3,014,163.00	Baht 17,613.00		


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Important Information
for
Invitation to Bid No. TS12-S-26(R)

The purpose of this section is to inform the Bidders to **carefully study** the details of the revised terms and conditions in the bidding documents. The following provisions have been **recently revised** as stated hereunder:

Additional Regulation

Information to be submitted with Bid as required in Item 3.2 has been revised.

The following paragraph in Remarks Item 4. of page 11 of Additional Regulation has been deleted :-

“In case that any Major Shareholder(s) of the Bidder is (are) juristic person(s), and such juristic person(s) has (have) Major Shareholder(s) who is (are) juristic person(s), the Bidder shall submit the list of the Major Shareholder(s)/ the Names of Manager/ Managing Partner/ Managing Director/ Executive/ Person Who Is Authorized to Manage the Business/ Partner/ Partner with Unlimited Liability/ of such juristic person(s) as per page 10-11 of this Additional Regulation. The requirement of submission of list of the Major Shareholder(s)/ the Names of Manager/ Managing Partner/ Managing Director/ Executive/ Person Who Is Authorized to Manage the Business/ Partner/ Partner with Unlimited Liability/ of such juristic person(s) shall apply to 2 tiers of Major Shareholder(s) who is(are) juristic person(s).”

Article A-3. Eligibility of Bidders: General Requirements and Article B-8. Information to be Submitted with Bid

Bidders shall provide written anti-corruption policies and guidelines as specified in Data Sheet.

Article A-4. Eligibility of Bidders: Technical Requirements

The Bidder shall be named in EGAT Accepted Bidders List for Supply and Construction of Substations attached at the end of Section A. Invitation to Bid.

Some of the Equipment to be proposed by the Bidder shall be only those specified in EGAT Accepted List for such Equipment as attached at the end of Section A. Invitation to Bid. The Bidder shall carefully study Article A-4. Eligibility of Bidders: Technical Requirements and make sure to propose Equipment correctly.

Article B-3. Bid Security

Terms and conditions regarding the forms of bid security have been revised.

Article E-15. Performance Security and Specimen of Performance Security

Terms and conditions regarding the forms and the amount of performance security have been revised.

Article E-16. Inspection and Tests

Terms and conditions regarding inspection and tests have been revised.

Article E-35. Advance Payment Security

Terms and conditions regarding the forms of advance payment security have been revised.

Article F-8. Drawings and Documents to be Furnished by the Contractor

Terms and conditions regarding EGAT's document management system in item a. have been added. The number of copies of the drawings and documents in Print and CD-ROM has been revised and Item c. Reproducible Drawings has been deleted.

Details in Drawings and Documents Required for Each Particular Equipment at the end of section F have been revised.

Article F-15. Liquidated Damages for Late Completion and Late Delivery

The total amount of liquidated damages shall not exceed ten (10) per cent of the total Contract Price, thereafter EGAT shall have the right, at its sole discretion, to terminate the Contract.

Article F-18. Maintenance Guarantee and Article F-19. Maintenance Security

In case all obligations on the part of the Contractor for the work under separated guarantee period under the Contract have been fulfilled, the Contractor is entitled to request EGAT to return the maintenance security guaranteed for such work regardless of the non-issuance of the Final Acceptance Certificate.

Article F-19. Maintenance Security and Specimen of Maintenance Guarantee

Terms and conditions regarding the forms and the amount of maintenance security have been revised.

Article G-5. Safety of Personnel and Third Parties and Prevention of Accidents

Safety terms and conditions have been revised. The Contractor shall observe and comply with the revised terms and conditions including Table 1. Safety Criteria and Conditions, Table 2. Contractor's Safety Information, and Table 3. Contractor Safety Evaluation Checklist which have been added at the end of Section G.

DATA SHEET
for
Invitation to Bid No. TS12-S-26(R)
(Two-envelope)

This Section consists of provisions that are specific to each procurement and supplement the information or requirements included in Bidding Documents.

Article A-3. Eligibility of Bidders: General Requirements

The following requirement shall be added to item I:

“j. Bidders shall provide written anti-corruption policies and guidelines with respect to procurement and supplies according to the Notification of the Anti-Corruption Co-Operation Committee Concerning Minimum Standards of the Anti-Corruption Policies and Guidelines in Relation to Procurement and Supplies Required to be Implemented by the Business Operator, Section 19 of the Government Procurement and Supplies Management Act B.E. 2560 (A.D. 2017).”

Article B-3. Bid Security

The amount of bid security shall be USD 2,631,870.- or THB 93,900,000.-.

Article B-4. Validity of Bids

The validity of the bid shall be for three hundred (300) Days from the date specified for opening of technical proposals.

Article B-8. Information to be Submitted with Bid

The following document shall be added to Article B-8. Information to be Submitted with Bid:

- s. ***Bidder's anti-corruption policies and guidelines in relation to procurement and supplies together with the completely filled out Anti-Corruption Compliance Checklist as provided.***

Article F-15. Liquidated Damages for Late Completion and Late Delivery, item a. For Complete Construction of Substation,

If the Contractor fails to meet any of the completion dates for Schedule 1 : 230 kV Ban Bueng 2 Substation (GIS) or Schedule 2 : 115 kV Ban Bueng 2 Substation (GIS) or Schedule 3 : 115 kV Ban Bueng Substation, the liquidated damages shall be at the rate of one-tenth of one (0.10) per cent of the total Contract Price for Schedule 1 : 230 kV Ban Bueng 2 Substation (GIS) and Schedule 2 : 115 kV Ban Bueng 2 Substation (GIS) and Schedule 3 : 115 kV Ban Bueng Substation for each Day of delay. This sum is payable regardless of the actual loss and/or damages incurred.

Maintenance Guarantee Period

- For all Work except 500 kV System

The Contractor shall guarantee the proper functioning of the Work for a period of one (1) Year except the following Equipment the guarantee period of which shall be as follows :

<u>Equipment</u>	<u>Period of Guarantee (Year)</u>
- Fault Recording System	2
- Control and Protection System	2

- For 500 kV System

The Contractor shall guarantee the proper functioning of the Work for a period of five (5) Years.

Defective Equipment to be replaced with the whole new set

Not Applicable

Anti-Corruption Compliance Checklist
(Consortium)

Bidders shall provide written anti-corruption policies and guidelines with respect to procurement and supplies pursuant to the Notification of the Anti-Corruption Co-Operation Committee Concerning Minimum Standards of the Anti-Corruption Policies and Guidelines in Relation to Procurement and Supplies Required to be Implemented by the Business Operator, in accordance with Section 19 of the Government Procurement and Supplies Management Act B.E. 2560 (A.D. 2017). This checklist shall be submitted with Bids.

Project :

State Agency: Electricity Generating Authority of Thailand

Member No. ... of the consortium:

.....

Item	Yes	No	Reference (Please specify Article)
1. Bidders have any written anti-corruption policies and guidelines which have been communicated to all levels of employees.			
2. Bidders impose penalty or regulations against corruption.			
3. Bidders have accessible channels or systems to report any suspicions or queries related to corruption.			
4. Bidders have internal personnel or unit explicitly responsible for the prevention of corruption.			

We hereby confirm that all above statements are true and correct.

Signed

(Name of Bidder)

(Authorized person)

Stamp company seal (if any)

Anti-Corruption Compliance Checklist
(Individual Company / Joint Venture)

Bidders shall provide written anti-corruption policies and guidelines with respect to procurement and supplies pursuant to the Notification of the Anti-Corruption Co-Operation Committee Concerning Minimum Standards of the Anti-Corruption Policies and Guidelines in Relation to Procurement and Supplies Required to be Implemented by the Business Operator, in accordance with Section 19 of the Government Procurement and Supplies Management Act B.E. 2560 (A.D. 2017). This checklist shall be submitted with Bids.

Project :

State Agency: Electricity Generating Authority of Thailand

Bidder Name :

Item	Yes	No	Reference (Please specify Article)
1. Bidders have any written anti-corruption policies and guidelines which have been communicated to all levels of employees.			
2. Bidders impose penalty or regulations against corruption.			
3. Bidders have accessible channels or systems to report any suspicions or queries related to corruption.			
4. Bidders have internal personnel or unit explicitly responsible for the prevention of corruption.			

We hereby confirm that all above statements are true and correct.

Signed

(Name of Bidder)

(Authorized person)

Stamp company seal (if any)

ELECTRICITY GENERATING AUTHORITY OF THAILAND

Nonthaburi
Thailand

INVITATION TO BID NO. TS12-S-26(R)

SUPPLY AND CONSTRUCTION OF 230/115 kV BAN BUENG 2 SUBSTATION (GIS), IMPROVEMENT OF 115 kV BAN BUENG SUBSTATION, AND SUPPLY OF CONTROL AND PROTECTION EQUIPMENT FOR 230 kV BO WIN SUBSTATION

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

(TWO-ENVELOPE)

A-1. **Invitation**

The Electricity Generating Authority of Thailand (EGAT) hereby invites sealed bids for supply and construction of 230/115 kV Ban Bueng 2 Substation (GIS), Improvement of 115 kV Ban Bueng Substation, and Supply of Control and Protection Equipment for 230 kV Bo Win Substation under Transmission System Expansion Project No.12 as described herein in accordance with terms, conditions and Specifications described in these Bidding Documents.

A-2. **Work Description**

The supply and construction of 230/115 kV Ban Bueng 2 Substation (GIS), Improvement of 115 kV Ban Bueng Substation, and Supply of Control and Protection Equipment for 230 kV Bo Win Substation will be on a supply and construction basis, the Contractor shall be responsible for complete supply, installation, construction and also engineering design work to the standard specified and best modern practice. The substations to be constructed and the scope of work under this Invitation are described in Section H. Scope of Work.

A-3. **Eligibility of Bidders: General Requirements**

I. All Bidders shall meet the following requirements; failure to so comply shall constitute sufficient ground for rejection.

- a. The Bidder shall be a partnership, firm or company, either alone or in joint venture or in consortium.
- b. The Bidder shall be well-established and maintain a permanent place of business.

- c. The Bidder shall not be, or supply the Equipment, from the country under the state of Civil War.
- d. The Bidder shall be a juristic person who manufactures or provides such material or services, as the case may be, and not be named in the List of Work Abandoners published by the Permanent Secretary, Ministry of Finance and/or in the Debarment List and/or in the List of Work Abandoners declared by EGAT.
- e. The Bidder shall not be a Jointly Interested Bidder with other Bidders as from the date of EGAT's issuance of the Invitation to Bid, or shall not be a person who undertakes any action as an "Obstruction of Fair Price Competition" as defined in Additional Regulation for this Invitation.
- f. The Bidder shall not either be EGAT's consultant or involving in EGAT's consultancy company under this Invitation, or have EGAT's personnel involved in his business as shareholder having voting right that can control his business, director, manager, officer, employee, agent or consultant except for the ones who are officially ordered by EGAT to act or participate therein.
- g. The Bidder shall not be the person who is privileged or protected not to be taken any legal proceeding under Thai Court; provided that such Bidder's government declares that such special privilege is waived.
- h. In case of a joint venture or consortium, the Bidder shall carry out all the work under such formation from the time of bidding until the fulfillment of the Contract.
- i. ***The Bidder must have purchased the bidding documents from EGAT. For a joint venture or a consortium, only one (1) member of the joint venture or consortium is required to purchase the bidding documents.***

In case the Bidder's name is not exactly the same as the purchaser's name, the purchaser shall notify EGAT of the name of the Bidder in writing prior to the bid opening time.

- II. All Bidders should preferably meet the following requirements; failure to so comply may constitute sufficient ground for rejection.
 - a. The Bidder shall have adequate fund to meet financial obligations incidental to this Contract.
 - b. The Bidder shall supply documentary evidence established in accordance with Article B-8. Information to be Submitted with Bid to demonstrate adequately that he is eligible to bid and is qualified to perform the Contract if his bid is accepted. Bidder should also demonstrate his capacity to perform the Work either with or without the use of subcontractor.

A-4. Eligibility of Bidders: Technical Requirements

I. All Bidders shall meet the following requirements; failure to so comply shall constitute sufficient ground for rejection.

- a. Being well-established and maintaining a permanent place of business.

If the Bidder is a new company formed by acquisition of or merger with other companies or business units before submitting the Bid, the experience records of any of such previous companies or business units that meet the requirements set forth herein are acceptable as the experience records of the Bidder.

If Bidder is a new company formed by acquisition of or merger with other companies or business units, the pending claim of any of such previous companies or business units shall be considered pending claim of the Bidder.

Reference records of either the parent or affiliated companies shall not be considered as the record of such Bidder.

- b. The Bidder shall be named in EGAT Accepted Bidders List for Supply and Construction of Substations attached at the end of Section A. Invitation to Bid.
- c. The Bidder shall propose Equipment manufactured by the qualified manufacturers who shall fulfill the following requirements:

1. Regularly manufacturing of Equipment of the type and similar ratings proposed.
2. Being well-established and maintaining a permanent place of business.
3. The manufacturer shall have the experience records that meet the requirements set forth herein.

Reference records of either parent or affiliated companies shall not be considered as the records of such manufacturer.

4. If the Manufacturer is a new company formed by acquisition of or merger with other companies or business units, and any of such previous companies or business units has the experience records that meet the requirements set forth herein, such experience records are acceptable as the experience records of the new company, provided that each item of the equipment to be supplied under this bid shall be manufactured from the same source of supply as indicated in each of such relevant supply records as described in Item I.c.6 below. Otherwise, it shall not be acceptable and shall be sufficient grounds for rejection.

For the avoidance of doubt, it is not allowed to combine the experience records of the previous companies or business units in order to meet the experience requirements.

5. For Equipment, having the same ratings as specified in EGAT Accepted List at the end of Section A. Invitation to Bid, shall have the following qualifications:

- 5.1 These Equipment shall be named in the EGAT Accepted List.

- 5.2 Having a past design test record of the Equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification (if required).

6. For Equipment not having the same ratings as specified in EGAT Accepted List at the end of Section A. Invitation to Bid.

- 6.1 For 230/115 kV Ratings of Gas-Insulated Switchgear (GIS). These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

- 6.1.1 Having one of the following qualifications:

- 6.1.1.1 Proposing the Equipment of the type and ratings which has already been accepted by EGAT.

OR

- 6.1.1.2 For 230 kV Gas-Insulated Switchgear (GIS):

Having a supply record of Equipment of the type proposed (type of enclosure, interrupter of circuit breaker, rated filling gas pressure) at the nominal system voltage of 220 kV or above, 3000 A or above, 50 kA or above, with successful operation/use of at least three (3) consecutive years in overseas country (not his own country) and at least three (3) substations of which total GIS bays shall not be less than twelve (12).

However, the Equipment of the type and short circuit current ratings proposed shall have a supply record of successful operation/use of at least three (3) consecutive years in overseas country (not his own country) and at least one (1) substation of which total GIS bays shall not be less than four (4).

In case that the supply record of Equipment of the type and ratings proposed fulfills the requirement, the manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use of at least three (3) substations of which total GIS bays shall not be less than twelve (12) and having minimum one (1) year in overseas country (not his own country). The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider or accept the proposed developed or modified type.

For 115 kV Gas-Insulated Switchgear (GIS):

Having a supply record of Equipment of the type proposed (type of enclosure, interrupter of circuit breaker, rated filling gas pressure) at the nominal system voltage of 110 kV or above, 2000 A or above, 40 kA or above, with successful operation/use of at least three (3) consecutive years in overseas country (not his own country) and at least three (3) substations of which total GIS bays shall not be less than twelve (12).

However, the Equipment of the type and short circuit current ratings proposed shall have a supply record of successful operation/use of at least three (3) consecutive years in overseas country (not his own country) and at least one (1) substation of which total GIS bays shall not be less than four (4).

In case that the supply record of Equipment of the type and ratings proposed fulfills the requirement, the manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use of at least three (3) substations of which total GIS bays shall not be less than twelve (12) and having minimum one (1) year in overseas country (not his own country). The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or

not to consider or accept the proposed developed or modified type.

6.1.2 Having a past design test record of the Equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification.

6.2 For 230 kV Control and Protection Panel and below, having the following qualifications:

6.2.1 Being local manufacturer.

6.2.2 Having one of the following qualifications:

6.2.2.1 Having a letter of acceptance for manufacturing of Control and Protection Boards and/or fabrication of the specific Equipment issued by EGAT within the scope specified therein.

OR

6.2.2.2 Being listed in EGAT ACCEPTED MANUFACTURER LIST FOR CONTROL AND PROTECTION PANEL (LOCAL MANUFACTURER) attached at the end of Section A. Invitation to Bid.

The design of Equipment layout shall be performed by the manufacturer of control and protection panel under the Substation Control and Protection System Integrator's supervision. However, the design and engineering of the complete substation protection and automation system shall be performed by the Substation Control and Protection System Integrator.

6.3 For Substation Control and Protection System Integrator

Having one of the following qualifications:

6.3.1 Having successful experience in EGAT's digital substation.

OR

6.3.2 Having at least two (2) records of practical experience on design and implementation of an IEC 61850 based control and protection system of a complete conventional or GIS with 110 kV or above digital substation (both station bus and process bus) with at least two (2) consecutive years of successful operation in overseas utilities (not his own country).

II. All Bidders should preferably meet the following technical requirements; failure to so comply may constitute sufficient ground for rejection.

- a. The Bidder shall have sufficient capacity to carry out the work.
- b. The Bidder shall have no just or proper claims pending against him with respect to breach in the performance of Contract on other similar works awarded by EGAT. In case the Bidder is a joint venture/consortium, either member of the joint venture/consortium shall have no just or proper claims pending against him with respect to breach in the performance of Contract on other similar works awarded by EGAT.
- c. The Bidder himself or his subcontractors, at the time of submitting this proposal, shall not carry excessive work nor be in a default position with respect to work with EGAT. Unsatisfactory past performance on Contract awarded by EGAT may be a sufficient reason of being disqualified.
- d. The Bidder shall propose Equipment from manufacturers who fulfill the requirements below. If there is any deficiency, EGAT reserves the right to require the Bidder to propose new manufacturer or new type/model of Equipment without any additional cost to EGAT.
 1. Regularly manufacturing of Equipment of the type and similar ratings proposed.
 2. Being well-established and maintaining a permanent place of business
 3. The manufacturer shall have the experience records that meet the requirements set forth herein.

Reference records of either parent or affiliated companies shall not be considered as the records of such manufacturer.

4. If the Manufacturer is a new company formed by acquisition of or merger with other companies or business units, and any of such previous companies or business units has the experience records that meet the requirements set forth herein, such experience records are acceptable as the experience records of the new company, provided that each item of the equipment to be supplied under this bid shall be manufactured from the same source of supply as indicated in each of such relevant supply records as described in Item II.d.6 below.

For the avoidance of doubt, it is not allowed to combine the experience records of the previous companies or business units in order to meet the experience requirements.

5. For Equipment, having the same ratings as specified in EGAT Accepted List at the end of Section A. Invitation to Bid, shall have the following qualifications:

5.1 These Equipment shall be named in the EGAT Accepted List.

5.2 Having a past design test record of the Equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification (if required).

6. For Equipment not having the same ratings as specified in EGAT Accepted List at the end of Section A. Invitation to Bid:

6.1 For 230/115 kV Ratings of Power Circuit Breaker, Disconnecting Switch and 115 kV Compact Switchgear shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

6.1.1 Having one of the following qualifications:

6.1.1.1 Proposing the Equipment of the type and ratings which has already been accepted by EGAT.

OR

6.1.1.2 For 230 kV Power Circuit Breaker and Disconnecting Switch:

Having a supply record of Equipment of the type proposed at nominal system voltage of 220 kV or above, 3000 A or above, 50 kA or above, with successful operation/use of at least three (3) consecutive years in an overseas country (not his own country) and at least three (3) three phase sets.

However, the Equipment of the type and short circuit current ratings proposed shall have a supply record of successful operation/use of at least three (3) consecutive years in overseas country (not his own country) and at least one (1) three phase set.

In case that the supply record of Equipment of the type and ratings proposed fulfilled the requirement, the manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use of at least one (1) year in overseas country (not his own country) and at least three (3) three phase sets. The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider or accept the proposed developed or modified type.

For 115 kV Power Circuit Breaker, Disconnecting Switch and Compact Switchgear:

Having a supply record of Equipment of the type proposed at nominal system voltage of 110 kV or above, 2000 A or above, 40 kA or above, with successful operation/use of at least three (3) consecutive years in an overseas country (not his own country) and at least three (3) three phase sets.

However, the Equipment of the type and short circuit current ratings proposed shall have a supply record of successful operation/use of at least three (3) consecutive years in overseas country (not his own country) and at least one (1) three phase set.

In case that the supply record of Equipment of the type and ratings proposed fulfilled the requirement, the manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use for at least one (1) year in overseas country (not his own country) and at least three (3) three phase sets. The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider or accept the proposed developed or modified type.

6.1.2 Having a past design test record of the Equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification.

6.2 For 230/115 kV Ratings of following Equipment: Instrument Transformer and Surge Arrester. These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

6.2.1 Having one of the following qualifications:

6.2.1.1 Proposing the Equipment of the type and ratings which has already been accepted by EGAT.

OR

- 6.2.1.2 Having a supply record of Equipment of the type and ratings proposed with successful operation/use of at least three (3) three phase sets and having minimum three (3) consecutive years in an overseas country (not his own country).

In case that the supply record of Equipment of the type and ratings proposed fulfills the requirement, the manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use of at least three (3) three phase sets and having minimum one (1) year in overseas country (not his own country). The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider or accept the proposed developed or modified type.

Supply records of the higher rating Equipment shall not be considered if the Bidder does not propose such higher rating Equipment in his bid.

- 6.2.2 Having a past design test record of the Equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification.

- 6.3 For 33, 22 and 11 kV ratings of following Equipment: Metal-Clad SF₆ Gas Insulated Switchgear, Power Circuit Breaker, Instrument Transformer, Disconnecting Switch and Surge Arrester:

Having one of the following qualifications:

- 6.3.1 Proposing the Equipment of the type and ratings which has already been accepted by EGAT.

OR

- 6.3.2 Having a supply record of Equipment of the type and ratings proposed with successful operation/use of at least three (3) consecutive years in an overseas country (not his own country) and at least three (3) three phase sets. The ratings and features of Equipment shall be the same or similar rating as EGAT specifies.

In case that the supply record of Equipment of the type and ratings proposed fulfilled the requirement, the

manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use of at least one (1) year in overseas country (not his own country) and at least three (3) three phase sets. The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider or accept the proposed developed or modified type.

Supply records of the higher rating Equipment shall not be considered if the Bidder does not propose such higher rating Equipment in his bid.

- 6.4 For Distribution Transformer, Power Fuse, AC&DC Distribution Board and Lighting Relay Panel (LRP), Load Center Unit Substation (LCUS), Junction Box, Battery Charger, Substation Steel Structure, 33 kV and below Cable Terminations, 115 kV and below XLPE Power Cable, Power Cable, Control Cable and Switchboard Wire, Lighting Cable, Copper Ground Wire, Overhead Ground Wire, Aluminum Conductor, Optical Fiber Cable, Switchyard Lighting Fixtures, Aluminum Tube, Compression Connector and Miscellaneous Hardware, Bus Fittings, Ground Rod, Thermite Welding Material, Grounding Hardware, Conduit and Conduit Fittings:

- 6.4.1 Being local manufacturer for the following Equipment:

Distribution Transformer, AC&DC Distribution Board and Lighting Relay Panel (LRP), Load Center Unit Substation (LCUS), Junction Box, Battery Charger, Substation Steel Structure, 115 kV and below XLPE Power Cable, Power Cable, Control Cable and Switchboard Wire, Lighting Cable, Copper Ground Wire, Overhead Ground Wire, Aluminum Conductor, Single mode optical fiber cable, Switchyard Lighting Fixtures, Aluminum Tube, Compression Connector and Miscellaneous Hardware, Thermite Welding Material and Conduit.

- 6.4.2 Having been granted a license for producing standard product by Thai Industrial Standard Institute (TISI), Ministry of Industry for the following Equipment:

60 kV through 115 kV XLPE Power Cable, Lighting cable and Aluminum conductor.

- 6.4.3 Having one of the following qualifications:

- 6.4.3.1 Having supply record of Equipment of the type and similar ratings proposed with successful operation/use for at least one (1) year.

OR

6.4.3.2 Having a letter of acceptance for manufacturing and/or fabrication of the specific Equipment issued by EGAT within the scope specified therein (For the local manufacturer).

6.5 For Insulator:

Having one of the following qualifications:

6.5.1 Having supply record with successful operation/use for at least three (3) consecutive years in overseas country (not his own country) and for following equipment:

6.5.1.1 Suspension Insulator, at least 10,000 units having the similar ANSI class as proposed.

6.5.1.2 Station Post Insulator, having the similar ANSI technical reference number as proposed.

OR

6.5.2 Having a letter of acceptance for manufacturing and/or fabrication of the specific Equipment issued by EGAT within the scope specified therein (For the local manufacturer).

6.6 For Stationary Battery:

Having one of the following qualifications:

6.6.1 Having supply record of Equipment of the type and similar ratings proposed with successful operation/use in substations/switchyards of at least three (3) consecutive years and at least three (3) sets.

In case that the supply record of Equipment of the type and similar ratings proposed fulfilled the requirements, the manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use of at least one (1) year. The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgement whether or not to consider or accept the proposed developed or modified type.

OR

6.6.2 Having a letter of acceptance for manufacturing and/or fabrication of the specific Equipment issued by EGAT within the scope specified therein (For the local manufacturer).

6.7 For above 33kV through 230 kV Outdoor Type Cable Termination and Cable Termination for GIS:

Having one of the following qualifications:

6.7.1 Proposing the Equipment of the type and ratings which have ever been accepted by EGAT.

OR

6.7.2 Having a supply record of Equipment of the type and ratings proposed with successful operation/use for at least three (3) consecutive years in an overseas country (not his own country) and at least five (5) three phase sets. The ratings and features of Equipment shall be the same or similar rating as EGAT specifies.

In case that the supply record of Equipment of the type and ratings proposed fulfilled the requirement, the manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use for at least one (1) year in overseas country (not his own country) and at least five (5) three phase sets. The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider or accept the proposed developed or modified type.

Supply records of the higher rating Equipment shall not be accepted if the Bidder does not propose such higher rating Equipment in his bid.

6.8 For 230 kV XLPE Power Cable:

Having one of the following qualifications:

6.8.1 Having a supply record of Equipment of the type and similar ratings proposed with successful operation/use for at least three (3) consecutive years in an overseas country (not his own country).

OR

6.8.2 Having a letter of acceptance for manufacturing and/or fabrication of the specific Equipment issued by EGAT within the scope specified therein (For the local manufacturer).

6.9 Proposing the protective relays from the manufacturers as listed in EGAT ACCEPTED MANUFACTURER LIST FOR PROTECTIVE RELAY attached at the end of Section A. Invitation to Bid and shall be in compliance with the details specified in EGAT's Specifications. Type/Model of the

protective relays proposed shall be as specified in EGAT ACCEPTED MULTIFUNCTION RELAY LIST attached at the end of Section A. Invitation to Bid.

6.10 For Fault Recording System:

6.10.1 Having one of the following qualifications:

6.10.1.1 The cabinet and all Equipment are completely wired by the FRS manufacturer before shipping to Thailand.

OR

6.10.1.2 The cabinet and the Equipment are wired in Thailand by the local cabinet manufacturer who has one of the following qualifications:

6.10.1.2.1 Having a letter of acceptance for manufacturing of Control and Protection Boards and/or fabrication of the specific Equipment issued by EGAT within the scope specified therein.

OR

6.10.1.2.2 Being listed in EGAT ACCEPTED MANUFACTURER LIST FOR CONTROL AND PROTECTION PANEL (LOCAL MANUFACTURER) attached at the end of Section A. Invitation to Bid.

The design and engineering shall be performed by the FRS manufacturer. The assembly, factory test and commissioning shall be in accordance with the FRS manufacturer's standard and shall be performed under the FRS manufacturer's supervisor.

6.10.2 Proposing the Fault Recording System (FRS) from the manufacturers as listed in EGAT ACCEPTED MANUFACTURER LIST FOR FAULT RECORDING SYSTEM attached at the end of Section A. Invitation to Bid and shall be in compliance with the details specified in EGAT's Specifications. Type/model of FRS proposed shall be as specified in EGAT

ACCEPTED FAULT RECORDING SYSTEM LIST
attached at the end of Section A. Invitation to Bid.

- 6.11 For supervisory software of IEC 61850 based substation control and protection system:

Having at least one (1) supply record of implementing supervisory software in IEC 61850 based substation control and protection system which comprises at least two (2) manufacturers of protective Intelligent Electronic Device (IED) with successful operation and use of at least one (1) year.

- 6.12 For Merging Unit (MU)

Having one of the following qualifications:

- 6.12.1 Proposing the MU of the type and rating which has already been successfully operated in EGAT's digital substation.

OR

- 6.12.2 Proposing the MU from the manufacturers as listed in EGAT ACCEPTED MANUFACTURER LIST FOR PROTECTIVE RELAY (regardless of country) attached at the end of Section A. Invitation to Bid and shall be in compliance with the details specified in EGAT's Specifications.

AND

Having supply records of at least three (3) digital substations (both station bus and process bus) of the type proposed with at least three (3) consecutive years of successful operation at nominal system voltage of 110 kV or above in overseas utilities (not his own country).

- 6.13 For Bay Control Unit (BCU)

Having one of the following qualifications:

- 6.13.1 Proposing the BCU of the type and rating which has already been successfully operated in EGAT's digital substation.

OR

- 6.13.2 Proposing the BCU from the manufacturers as listed in EGAT ACCEPTED MANUFACTURER LIST FOR PROTECTIVE RELAY (regardless of country) attached at the end of Section A. Invitation to Bid and shall be in compliance with the details specified in EGAT's Specifications.

AND

Having supply records of at least three (3) digital substations (both station bus and process bus) of the type proposed with at least three (3) consecutive years of successful operation at nominal system voltage of 110 kV or above in overseas utilities (not his own country).

6.14 Being local manufacturer for steel supporting structure of Instrument Transformer, Surge Arrester and Disconnecting Switch.

6.15 For Closed-circuit television (CCTV) system and equipment:

6.15.1 Proposed camera and Network Video Recorder (NVR) manufacturer shall have a representative or a branch office of manufacturer in Thailand for at least ten (10) years.

6.15.2 Proposed brand of IP cameras shall have a supply record of IP cameras for at least five hundred (500) IP cameras per contract with successful operation/use for at least three (3) years in Thailand.

6.15.3 The bidder or subcontractor shall have one of the following qualifications:

6.15.3.1 Having experiences in installation and cabling of outdoor-type IP cameras for at least fifty (50) cameras per contract with successful operation/use for at least three (3) years in Thailand.

OR

6.15.3.2 Having experiences in optical fiber cabling in substation switchyards for at least five (5) substations per contract with successful operation/use for at least three (3) years in Thailand.

6.15.4 Being local manufacturer for the following Equipment: CCTV Rack cabinet, Monitoring desk, CCTV pole, 12-core ADSS optical fiber cable.

e. Proposing the manufacturer who has no just or proper claims pending against Equipment of the same type/model to be proposed under this bid.

In case the manufacturer is a new company formed by acquisition or merger with other companies or business units, the pending claim of any of such previous companies or business units shall be considered pending claim of the manufacturer.

- f. Proposing reputable subcontractors, for the portion of the work to be subcontracted, having adequate technical knowledge, ability and capacity to perform such work and having at least three years experience in the performance of similar work and of equal magnitude to the work to be subcontracted. If any proposed subcontractor(s) is (are) not qualified in the opinion of EGAT, the Bidder is required to select other subcontractor(s) at his own cost to the satisfaction of EGAT.

Definitions:

Year(s) of operation/use: The period of operation Completion date or Commissioning date or Taking over date or Operation date or Put in service date stated in End User Certificate or the sufficient documentary evidence before bid opening.

A-5. Joint Venture or Consortium

In the event that the successful Bidder is a joint venture or a consortium formed of two or more companies, EGAT requires that the parties to the joint venture or the consortium accept joint and several liability for all obligations under the Contract.

A-6. Preparation and Delivery of Bids

Bids shall be prepared in accordance with the Instructions to Bidders contained in the Bidding Documents in one (1) original and three (3) hard copies, in English, on the bid forms included for this purpose and shall be accompanied with a bid security as required under Article B-3. Bid Security.

The original and each copy of the proposal shall be placed in two (2) separate sealed envelopes:

Envelope I which shall contain a sealed technical proposal, and
Envelope II which shall contain a sealed price proposal.

Envelope I

Technical proposal will be placed in separate sealed envelope marked in capital letters in the lower left-hand corner as follows:

INVITATION TO BID NO. TS12-S-26(R)

SUPPLY AND CONSTRUCTION OF 230/115 kV BAN BUENG 2
SUBSTATION (GIS), IMPROVEMENT OF 115 kV BAN BUENG
SUBSTATION, AND SUPPLY OF CONTROL AND PROTECTION
EQUIPMENT FOR 230 kV BO WIN SUBSTATION

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

TECHNICAL PROPOSAL

The Envelope for the technical proposal shall contain the following :

- a. the completed Proposal Data Forms of the proposed proposal(s)
- b. reference documents pertaining to Bidder's qualification and experience under Article A-3. Eligibility of Bidders: General Requirements, A-4. Eligibility of Bidders: Technical Requirements, and Article B-8. Information to be submitted with Bid
- c. delivery date guaranteed by Bidders
- d. any minor deviations on Technical Specifications
- e. any other technical information and drawings the Bidder deems to be adequate to explain his bid
- f. Confirmation Form of not being a Jointly Interested Bidder with other Bidders and not being a person who undertakes any actions as an Obstruction of Fair Price Competition, and Registration/Non-registration with the Revenue Department as a VAT registrant

If the Bidder has registered as a VAT registrant, he shall submit EGAT an evidence of VAT registration. On the contrary, if the Bidder is not registered as a VAT registrant, he shall inform EGAT whether he will register as a VAT registrant or not.

In case the Bidder is a consortium, each member of the consortium shall fill in the Confirmation Form provided for consortium Bidders.

- g. Filled-in Documentary List and documents required according to Additional Regulation

Strictly no prices or reference to price shall be made in the documentation contained in this Envelope. Violation of this requirement will be reason for rejection of the bid.

Envelope II

Price proposal will be placed in separate sealed envelope marked in capital letters in the lower left-hand corner as follows:

INVITATION TO BID NO. TS12-S-26(R)

SUPPLY AND CONSTRUCTION OF 230/115 kV BAN BUENG 2
SUBSTATION (GIS), IMPROVEMENT OF 115 kV BAN BUENG
SUBSTATION, AND SUPPLY OF CONTROL AND PROTECTION
EQUIPMENT FOR 230 kV BO WIN SUBSTATION

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

PRICE PROPOSAL

The Envelope for the price proposal shall contain the following :

- a. price schedules according to Section C
- b. price schedules data CD in Microsoft Excel format
- c. Discount Form

The bid security in accordance with Article B-3. Bid Security shall be submitted in a separate envelope.

The original and three (3) hard copies of the technical proposal and the price proposal shall be addressed and delivered to :

International Procurement Department - Transmission Segment
Procurement and Inventory Management Division
Electricity Generating Authority of Thailand
Bangkruai, Nonthaburi 11130
Thailand

on or before 10:00 a.m., Bangkok Standard Time, see Tentative Schedule

If the envelope(s) is not sealed, marked and addressed as required above, EGAT will assume no responsibility for the bid misplacement or premature opening.

Technical proposals will be opened publicly at ***Bidding Room, 1st floor, Tor 082 Building*** and at the time specified above.

Bids received after the time stipulated herein shall be rejected and returned unopened.

The technical proposals will be reviewed to determine their responsiveness to the Specifications and requirements.

The price proposals of the responsive technical proposals will be opened publicly at the place and time which will be specified at a later date, which will not be later than 150 Days after the technical proposal opening.

A-7. Availability of Bidding Documents

The Bidding Documents in CD-ROM are available for examination and can be obtained from EGAT at the hereunder address upon payment to EGAT, non-refundable, in the amount of USD 500.- or Baht 15,000.-; these prices include the value added tax.

International Procurement Department - Transmission Segment
Procurement and Inventory Management Division
Electricity Generating Authority of Thailand
Bangkruai, Nonthaburi 11130
Thailand

Note : At the time of bidding, EGAT's Specifications and all Drawings need not be submitted, although they are considered as part of the Bidding Documents.

EGAT Accepted Bidders List for Supply and Construction of Substations

No.	Bidder / Country	Acceptance for		
		500 kV	230 kV	115&69 kV
1	Hitachi Energy (Thailand) Limited / Thailand	YES	YES	YES
2	Grid Solutions SAS / France	YES	YES	YES
3	Hitachi Ltd. / Japan	YES	YES	YES
4	Hyosung Heavy Industries Corporation / Korea	YES	YES	YES
5	KEC International Limited / India	YES	YES	YES
6	Mitsubishi Corporation / Japan	YES	YES	YES
7	Mitsubishi Electric Corporation / Japan	YES	YES	YES
8	Precise System and Project Co., Ltd. / Thailand	YES	YES	YES
9	SEPCOIII Electric Power Construction Co., Ltd. / P.R.China	YES	YES	YES
10	Siemens Energy Limited / Thailand	YES	YES	YES
11	Sri U-Thong Limited / Thailand	YES	YES	YES
12	TEDA Company Limited / Thailand	YES	YES	YES
13	Joint Venture of Sinohydro and SEPCOIII (Sinohydro (Thailand) Company Limited / Thailand and SEPCOIII Electric Power Construction Co., Ltd. / P.R.China)	YES	YES	YES
14	Consortium of Grid Solutions (Thailand) Ltd. and Grid Solutions SAS (Grid Solutions (Thailand) Ltd. / Thailand and Grid Solutions SAS / France)	YES	YES	YES
15	Consortium of Larsen & Toubro Limited and Sri U-Thong Limited (Larsen & Toubro Limited / India and Sri U-Thong Limited / Thailand)	YES	YES	YES
16	Consortium of Loxley Public Co., Ltd. and Sri U-Thong Limited (Loxley Public Co., Ltd. / Thailand and Sri U-Thong Limited / Thailand)	YES	YES	YES
17	Consortium of Sinohydro and SEPCOIII (Sinohydro (Thailand) Company Limited / Thailand and SEPCOIII Electric Power Construction Co., Ltd. / P.R. China)	YES	YES	YES
18	SBV Consortium (Sumitomo Corporation / Japan, Black & Veatch (Thailand) Limited / Thailand and Italian-Thai Development / Thailand)	YES	YES	YES
19	The Consortium of Mitsubishi Corporation and DEMCO Public Company Limited (Mitsubishi Corporation / Japan and DEMCO Public Company Limited / Thailand)	YES	YES	YES
20	The Consortium of Precise System and Project Co., Ltd. and Hitachi Ltd. (Precise System and Project Co., Ltd. / Thailand and Hitachi Ltd. / Japan)	YES	YES	YES
21	The Consortium of Mitsubishi Corporation and PWH (Thailand) Company Limited (Mitsubishi Corporation / Japan and PWH (Thailand) Company Limited / Thailand)	YES	YES	YES
22	Consortium of Larsen & Toubro Limited and Mitsubishi Corporation (Larsen & Toubro Limited / India and Mitsubishi Corporation / Japan)	YES	YES	YES
23	Sri U-Thong & LPS CONSORTIUM (Sri U-Thong Limited / Thailand and LOXLEY POWER SYSTEMS COMPANY LIMITED / Thailand)	YES	YES	YES
24	The Consortium of DEMCO Public Company Limited, KINDEN Corporation and Sri U-Thong Limited. (DEMCO Public Company Limited / Thailand, KINDEN Corporation / Japan and Sri U-Thong Limited / Thailand)	YES	YES	YES
25	J.R.W. Utility - Siemens Energy Consortium (J.R.W. Utility Public Company Limited / Thailand and Siemens Energy Limited / Thailand)	YES	YES	YES
26	SIEMENS ENERGY & LPS CONSORTIUM (Siemens Energy Limited / Thailand and LOXLEY Power Systems Company Limited / Thailand)	YES	YES	YES
27	CONSORTIUM OF HYOSUNG HEAVY INDUSTRIES CORPORATION & FUTURE ELECTRICAL CONTROL COMPANY LIMITED (HYOSUNG HEAVY INDUSTRIES CORPORATION / Korea and FUTURE ELECTRICAL CONTROL COMPANY LIMITED / Thailand)	YES	YES	YES

เอกสารควบคุม

รับรองสำเนาโดย ททอ-ส.กสส-ส.อวส.
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EGAT Accepted Bidders List for Supply and Construction of Substations

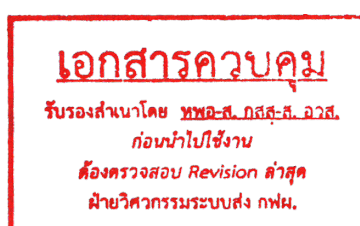
No.	Bidder / Country	Acceptance for		
		500 kV	230 kV	115&69 kV
28	Joint Venture of SEPCOIII-BYP (SEPCOIII Electric Power Construction Co., Ltd. / P.R. China and Benyapha Power Line Co., Ltd. / Thailand)	YES	YES	YES
29	Consortium of KEC International Limited and Mega Consultants Company Limited (KEC International Limited / India and Mega Consultants Company Limited / Thailand)	YES	YES	YES
30	Consortium of KEC International Limited and GreenTech Solution Co., Ltd. (KEC International Limited / India and GreenTech Solution Co., Ltd. / Thailand)	YES	YES	YES
31	Consortium of KEC International Limited and CS Power and Project Company Limited (KEC International Limited / Indai and CS Power and Project Company Limited / Thailand)	YES	YES	YES
32	Hyundai Engineering & Construction Co., Ltd. / Korea		YES	YES
33	Larsen & Toubro Limited / India		YES	YES
34	Kalpataru Power Transmission Limited / India		YES	YES
35	PWH (THAILAND) CO., LTD. / Thailand		YES	YES
36	DEMCO Public Company Limited / Thailand		YES	YES
37	Italthai Engineering Co., Ltd. / Thailand		YES	YES
38	Sieyuan Electric Co., Ltd. / China		YES	YES
39	Black & Veatch (Thailand) Ltd. / Thailand		YES	YES
40	PESTECH Sdn. Bhd. / Malaysia		YES	YES
41	Shandong Taikai Power Engineering Co., Ltd. / China		YES	YES
42	SC-ST-BYP JOINT VENTURE COMPANY LIMITED / Thailand		YES	YES
43	China CAMC Engineering CO., LTD. / China		YES	YES
44	Kinden Corporation - Kinden (Thailand) Co., Ltd. Joint Venture (Kinden Corporation / Japan and Kinden (Thailand) Co., Ltd. / Thailand)		YES	YES
45	The Joint Venture of SRI and PWH (Sri U-Thong Limited / Thailand and PWH (Thailand) Company Limited / Thailand)		YES	YES
46	The Consortium of Kinden Corporation and Perfect Engineering Service Public Co., Ltd. (Kinden Corporation / Japan and Perfect Engineering Service Public Co., Ltd. / Thailand)		YES	YES
47	The Consortium of SCL-STC and ITE (Sinohydro Corporation Limited / China, Sinohydro (Thailand) Company Limited / Thailand and Italthai Engineering Co., Ltd. / Thailand)		YES	YES
48	The Consortium of Siemens Energy Limited and Sinkarnchang Company Limited (Siemens Energy Limited / Thailand and Sinkarnchang Company Limited / Thailand)		YES	YES
49	The Consortium of Siemens Energy Limited and Standard Performance Company Limited (Siemens Energy Limited / Thailand and Standard Performance Company Limited / Thailand)		YES	YES
50	JOINT VENTURE OF SCL, STC AND XD (Sinohydro Corporation Limited / China, Sinohydro (Thailand) Co., Ltd. / Thailand and Xian Electric Engineering Co., Ltd. / China)		YES	YES
51	JOINT VENTURE OF SINOHYDRO CORPORATION LIMITED AND SINOHYDRO (THAILAND) CO., LTD. (Sinohydro Corporation Limited / China and Sinohydro (Thailand) Co., Ltd. / Thailand)		YES	YES
52	LOXLEY & LPS CONSORTIUM (LOXLEY PUBLIC COMPANY LIMITED / Thailand and LOXLEY POWER SYSTEMS COMPANY LIMITED / Thailand)		YES	YES
53	The consortium of DEMCO Public Company limited and KINDEN Corporation (DEMCO Public Company Limited / Thailand and KINDEN Corporation / Japan)		YES	YES
54	The Consortium of Shanghai Electric Group Company Limited & Future Electrical Control Company Limited (Shanghai Electric Group Company Limited / China and Future Electrical Control Company Limited / Thailand)		YES	YES
55	Consortium of ITE - NCPE (Italthai Engineering Co., Ltd./ Thailand and North China Power Engineering Co., Ltd. of China Power Engineering Consulting Group / China)		YES	YES

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EGAT Accepted Bidders List for Supply and Construction of Substations

No.	Bidder / Country	Acceptance for		
		500 kV	230 kV	115&69 kV
56	The Consortium of DEMCO Public Company Limited, KINDEN Corporation and Hyundai Electric & Energy Systems Company Limited (DEMCO Public Company Limited / Thailand and KINDEN Corporation / Japan and Hyundai Electric & Energy Systems Company Limited / Korea)		YES	YES
57	Grid Solutions (Thailand) Limited / Thailand		YES	YES
58	CGGC-PG Joint Venture / China		YES	YES
59	Consortium of Pinggao Group Co., Ltd. and Italthai Engineering Co., Ltd. (Pinggao Group Co., Ltd. / China and Italthai Engineering Co., Ltd. / Thailand)		YES	YES
60	Consortium of Linxon India Private Limited and Linxon (Thailand) Limited (Linxon India Private Limited / India and Linxon (Thailand) Limited / Thailand)		YES	YES
61	NARI GROUP CORPORATION / P.R. China		YES	YES
62	Joint Venture of STC-BYP (Sinohydro (Thailand) Co., Ltd. / Thailand and Benyapha Power Line Co., Ltd. / Thailand)		YES	YES
63	SINOHYDRO (THAILAND) CO., LTD. / Thailand		YES	YES
64	The Consortium of Kalpataru Power Transmission Limited and TSPG Company Limited (KPTL-TSPG Consortium) (Kalpataru Power Transmission Limited / India and TSPG Company Limited / Thailand)		YES	YES
65	Consortium of NARI GROUP CORPORATION and NARI (THAILAND) Co., Ltd. (NARI GROUP CORPORATION / P.R. China and NARI (THAILAND) Co., Ltd. / Thailand)		YES	YES
66	Consortium of Secco H.V. and Nari Group Corporation (Secco H.V. Co., Ltd. / Thailand and Nari Group Corporation / P.R. China)		YES	YES
67	The consortium of Grid Solutions (Thailand) Ltd. and J.R.W. Utility PLC. (Grid Solutions (Thailand) Limited / Thailand and J.R.W. Utility Public Company Limited / Thailand)		YES	YES
68	CONSORTIUM OF LARSEN & TOUBRO LIMITED AND EPCC ENGINEERING CO., LTD. (LARSEN & TOUBRO LIMITED / India and EPCC ENGINEERING CO., LTD. / Thailand)		YES	YES
69	CONSORTIUM OF LARSEN & TOUBRO LIMITED AND PPPO COMPANY LIMITED (LARSEN & TOUBRO LIMITED / India and PPPO COMPANY LIMITED / Thailand)		YES	YES
70	The Consortium of Shanghai Electric Group Company Limited & Yipintsoi Energy Company Limited (Shanghai Electric Group Company Limited / P.R. China and Yipintsoi Energy Company Limited / Thailand)		YES	YES
71	The Consortium of Transrail Lighting Limited, Shyama Power India Limited and CS Power and Project Company Limited (Transrail Lighting Limited / India and Shyama Power India Limited / India and CS Power and Project Company Limited / Thailand)		YES	YES
72	Hyundai Heavy Industries Co., Ltd. / Korea			YES
73	LOXLEY POWER SYSTEMS COMPANY LIMITED / Thailand			YES
74	Future Electrical Control Company Limited / Thailand			YES
75	NARI Group Corporation / China			YES
76	Consortium ITE and HHI (Italthai Engineering Co., Ltd. / Thailand and Hyundai Heavy Industries Company Limited / Korea)			YES
77	The Consortium of Demco Public Co., Ltd. Perfect Engineering Service Public Co., Ltd. And Demco Power Co., Ltd. (Demco Public Company Limited / Thailand, Perfect Engineering Service Public Co., Ltd. / Thailand and Demco Power Co., Ltd. / Thailand)			YES



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EGAT Accepted Bidders List for Supply and Construction of Substations

No.	Bidder / Country	Acceptance for		
		500 kV	230 kV	115&69 kV
78	The Consortium of A2 Technologies Vietnam Co., Ltd. and A2 Technologies Co., Ltd. (Thailand) (A2 Technologies Vietnam Co., Ltd. / Vietnam and A2 Technologies Co., Ltd. (Thailand) / Thailand)			YES
79	Gunkul Power Development Company Limited / Thailand			YES
80	Secco H.V. Co., Ltd. / Thailand			YES
81	Larch & Laurel Co., Ltd. / Thailand			YES

Note

- 1 **Additionally, any bidders in the EGAT Accepted Bidders List for Supply and Construction of Substations of the same voltage level are allowed to form a new consortium or joint venture with other bidders in the accepted list. All parties of the new consortium or joint venture shall be accepted at the voltage level of the proposal.**
- 2 **The Bidders listed in EGAT Accepted Bidders List for Supply and Construction of Substations are in accordance with the requirements set forth in the Eligibility of Bidder No. EB-PQ-SUB-01. In bid evaluation, EGAT will not be bound to accept the bidder in EGAT Accepted Bidders List for Supply and Construction of Substations. EGAT reserves the right to accept the bidder considering the conformity of the bid requirements.**

Bid No. TS12-S-26(R)

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 รับรองสำเนาโดย ทพอ-ส. กสส-ส. อวส.
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7 พฤศจิกายน 2566

EGAT Accepted Surge Arrester List

Description	Manufacturer / Country	Type / Model
396 kV SA (Porcelain)	Toshiba Hamakawasaki Factory / Japan	RVLQB-396HY
	Hubbell Power Systems Inc. / USA	VN/215516-9141
	Hitachi Energy Sweden AB / Sweden	EXLIM P396-GH550
	Tridelta Meidensha GmbH / Germany	SB 396/20.4-I
192 kV SA (Porcelain)	Toshiba Hamakawasaki Factory / Japan	RVLQC-192VY
	Siemens Aktiengesellschaft / Germany	3EP4 192-2PE32
	Hubbell Power Systems Inc. / USA	MVN192BB152AA
	Hitachi Energy Sweden AB / Sweden	EXLIM Q192-EH245
	Tridelta Meidensha GmbH / Germany	SB 192/10.3-0
108 kV SA (Porcelain)	Toshiba Hamakawasaki Factory / Japan	RVLQC-108VY
	Siemens Aktiengesellschaft / Germany	3EP4 108-2PE31
	Hubbell Power Systems Inc. / USA	MVN108BB088AA
	Hitachi Energy Sweden AB / Sweden	EXLIM Q108-EH123
	Tridelta Meidensha GmbH / Germany	SB 108/10.3-0

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7 พฤศจิกายน 2566

EGAT Accepted Current Transformer List

Description	Manufacturer / Country	Type / Model
230 kV CT, 3000A, 50kA	HITACHI ENERGY SWEDEN AB / Sweden	IMB 245
	ELECTROTECHNICAL ARTECHE HER MANOS, S.L. / Spain	CA-245
	NISSIN ELECTRIC CO., LTD. / Japan	FGCH-170
	ABB JIANGSU JINGKE INSTRUMENT TRANSFORMER CO., LTD. / China	LB7-245 (Creepage Distance 7812 mm)
115 kV CT, 2000A, 40kA	HITACHI ENERGY SWEDEN AB / Sweden	IMB 123
	ELECTROTECHNICAL ARTECHE HER MANOS, S.L. / Spain	CA-123
	NISSIN ELECTRIC CO., LTD. / Japan	FGCH-100
	ABB JIANGSU JINGKE INSTRUMENT TRANSFORMER CO., LTD. / China	LB7-145 (Creepage Distance 4495 mm)
	JIANGSU SIEYUAN HERTZ INSTRUMENT TRANSFORMER CO., LTD. / China	LVB-110



Bid No. TS12-S-20(B)

เอกสารควบคุม
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7 พฤศจิกายน 2566

EGAT Accepted Gas Insulated Switchgear List

Description	Manufacturer / Country	Type/Model	Equipment Rating			Type of Mechanism			Alignment of Circuit Breaker	Referenced GIS Component		
			kV	A	kA	Spring	Hydraulic	Hydraulic-Spring		CT	VT	Bushing (Porcelain)
										Manufacturer / Country	Manufacturer / Country	Manufacturer / Country
550 kV, 4000 A, 50 kA GIS	Hitachi Energy Switzerland Ltd. / Switzerland	ELK-3	550	4000	63			✓	Horizontal	Pfiffner/Switzerland	Trench/Germany Ritz/Germany Pfiffner/Switzerland	LAPP/Germany XD/China
	Siemens AG / Germany	8DQ1P2	550	4000	50	✓			Horizontal	Trench/Germany	Trench/Germany	HSP/Germany
	GE Grid Solutions / France	T155	550	4000	50	✓			Horizontal	Pfiffner/Switzerland ENPAY/Turkey	GE/France Ritz/Germany	PPC/Austria Ceralep/France
	Hitachi Ltd. / Japan	IFT	550	6300	63		✓		Horizontal	Hitachi/Japan Meiden Chemical/Japan	Nissin/Japan Toko/Japan	N.G.K./Japan
	HD Hyundai Electric Co., Ltd. / Korea	550SR	550	4000	63		✓		Horizontal	Daeyoung/Korea Hyundai/Korea	Nissin/Japan TOKO/Japan Trench/Germany Nissin/China Sieyuan/China	PPC/Germany PPC/Sweden TYCO/Switzerland N.G.K/Japan
	Mitsubishi Electric Corporation / Japan	500-GPS	550	4000	50	✓			Horizontal	Melco/Japan	Melco/Japan	N.G.K./Japan
	New Northeast Electric Group High Voltage Switchgear Co., Ltd./ China	ZF15-550	550	4000	63			✓	Horizontal	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liling Huaxin Insulator Technology Cp.,Ltd./China

Bid No. TS12-S-26(B)

เอกสารควบคุม
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 ฝ่ายวิศวกรรมระบบส่ง กฟผ.

7 พฤศจิกายน 2566

EGAT Accepted Gas Insulated Switchgear List

Description	Manufacturer / Country	Type/Model	Equipment Rating			Type of Mechanism			Alignment of Circuit Breaker	Referenced GIS Component		
			kV	A	kA	Spring	Hydraulic	Hydraulic-Spring		CT	VT	Bushing (Porcelain)
										Manufacturer / Country	Manufacturer / Country	Manufacturer / Country
245 kV, 4000 A, 50 kA GIS	Hitachi Energy Switzerland Ltd. / Switzerland	ELK-14	245	4000	63 50			✓	Horizontal	Pfiffner/Switzerland ABB/Czech	Pfiffner/Switzerland Trench/Germany	LAPP/Germany XD/China
	GE Grid Solutions / France	B105	245	4000	50	✓			Horizontal	ENPAY/Turkey ALCE/Turkey GE/France	GE/France	PPC Insulators/Austria Ceralep/France GE/France
	Hyosung Heavy Industries Corporation / Korea	HSG-305B	300	4000	50	✓			Horizontal	Hyosung/Korea	Nissin/Japan Toko/Japan Siyuan/China Nissin/China Toko/Korea	LAPP/Germany Huaxin/China XD/China
	Xian XD Switchgear Electric Co., Ltd./ China	ZF9-252	245	4000	50	✓			Vertical	XD/China Nanjing Zhida Electric/China	XD/China	XD/China
	New Northeast Electric Group High Voltage Switchgear Co., Ltd./ China	ZFW20-252	245	4000	50	✓			Horizontal	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liling Huaxin Insulator Technology Cp.,Ltd./China
	GE High Voltage Switchgear (Suzhou) Co., Ltd / China	B105	245	4000	50	✓			Horizontal	Nanjing Zhida / China	Suzhou TOKO / China	Liling Huaxin Insulator Technology Cp.,Ltd./China
	HD Hyundai Electric Co., Ltd. / Korea	300SR	245	4000	50	✓			Horizontal	Daeyoung/Korea Hyundai/Korea	Nissin/Japan TOKO/Japan Trench/Germany	PPC/Germany PPC/Sweden TYCO/Switzerland N.G.K/Japan LAPP/Germany Zapel/Poland

Bid No.

เอกสารควบคุม
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7 พฤศจิกายน 2566

EGAT Accepted Gas Insulated Switchgear List

Description	Manufacturer / Country	Type/Model	Equipment Rating			Type of Mechanism			Alignment of Circuit Breaker	Referenced GIS Component		
			kV	A	kA	Spring	Hydraulic	Hydraulic-Spring		CT	VT	Bushing (Porcelain)
										Manufacturer / Country	Manufacturer / Country	Manufacturer / Country
123 kV, 3150/2000 A, 40 kA GIS Main bus 3150 A Feeder 2000 A	ABB High Voltage Switchgear (Xiamen) Co., Ltd. / China	ELK-04	145	3150	40			✓	Vertical	Pfiffner/Switzerland Sihui/China ABB Jingke / China	Pfiffner/Switzerland Sieyuan/China ABB Jingke / China	XD/China
	HD Hyundai Electric Co., Ltd. / Korea	145SP-1	123	3150	40	✓			Vertical	Dongwoo/Korea	Nissin/Japan Nissin/China Sieyuan/China	LAPP/Germany
	Hyosung Heavy Industries Corporation / Korea	HSG-144D	145	3150	40	✓			Vertical	Hyosung / Korea Samnung/Korea	Nissin/Japan Sieyuan/China Nissin/China Toko/Korea	LAPP/Germany Huaxin/China XD/China
	New Northeast Electric Group High Voltage Switchgear Co., Ltd./ China	ZFW20-145	145	3150	40	✓			Vertical	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liling Huaxin Insulator Technology Cp.,Ltd./China
	ILJIN Electric Co., Ltd. / Korea	IJS 1440	145	3150	40	✓			Vertical	Samnung / Korea	Toko Takaoka Korea / Korea	Lapp / Romania
	TOSHIBA Energy Systems & Solutions Corporation/ Japan	G3A-b	145	3150	40	✓			Vertical	TOSHIBA / Japan	TOSHIBA / Japan	TOSHIBA / Japan
	Shanghai Sieyuan High Voltage Switchgear Co., Ltd. / China	ZF28A-145	145	3150	40	✓			Vertical	Shanghai Sieyuan High Voltage Switchgear Co., Ltd. / China	Jiangsu Sieyuan Hertz Co.,Ltd. / China	XD/China
	Siemens High Voltage Switchgear Co., Ltd. Shanghai / China	8DN8	123	3150	40	✓			Vertical	Sihui/China	Nissin/China Sieyuan/China	XD/China

Note. The Equipment listed in EGAT Accepted Gas Insulated Switchgear List are in accordance with the requirements set forth in the Eligibility of Equipment No. EB-PQ-GIS-01. In bid evaluation, EGAT will not be bound to accepted the equipment in EGAT Accepted Gas Insulated Switchgear List. EGAT reserves the right to accept the equipment considering the conformity of the bid requirements.

Bid No. TS-12-S-26(P)

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7 พฤศจิกายน 2566

EGAT Accepted Disconnecting Switch List

Description	Manufacturer / Country	Type/Model	Type of Mechanism
550 kV, 4,000 A air switch (Main blade: Motor operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	STC	CD101
	Grid Solution S.p.A. / Italy	S3CD550/4000	CMM
	Hapam B.V. / The Netherlands	SSBIII-550	MT150
550 kV, 4,000 A, air switch with grounding blade (Main blade: Motor operated, Grounding blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	STC-E	CD201
	Grid Solution S.p.A. / Italy	S3CDT550/4000	CMM for DS and ES
	Hapam B.V. / The Netherlands	SSBIII-AM-550	MT150 for DS and HAC for ES
245 kV, 4,000 A, air switch (Main blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB	CM110
	Grid Solutions / Italy	S3CD245/4000	CML
	Hapam B.V. / The Netherlands	SSBIII-245	HAC
245 kV, 4,000 A, air switch with grounding blade (Main blade: Manually operated, Grounding blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB-E	CM210
	Grid Solution S.p.A. / Italy	S3CDT245/4000	CML for DS and ES
	Hapam B.V. / The Netherlands	SSBIII-AM-245	HAC for DS and ES
245 kV, 3,150 A air switch (Main blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB	CM110
	Hapam B.V. / The Netherlands	SSBIII-245	HAC
	Grid Solution S.p.A. / Italy	S3C245/3150	CML
245 kV, 3,150 A air switch with grounding blade (Main blade: Manually operated, Grounding blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB-E	CM210
	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB-E Special	CM210
	Hapam B.V. / The Netherlands	SSBIII-AM-245	HAC for DS and ES
	Grid Solution S.p.A. / Italy	S3CT245/3150	CML for DS and ES

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EGAT Accepted Disconnecting Switch List

Description	Manufacturer / Country	Type/Model	Type of Mechanism
123 kV, 3,150 A air switch (Main blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB	CM110
	Grid Solution S.p.A. / Italy	S3C123/3150	CML
	Hapam B.V. / The Netherlands	SSBIII-123	HAC
123 kV, 3,150 A air switch with grounding blade (Main blade: Manually operated, Grounding blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB-E	CM210
	Grid Solution S.p.A. / Italy	S3CT123/3150	CML for DS and ES
	Hapam B.V. / The Netherlands	SSBIII-AM-123	HAC for DS and ES
123 kV, 2,000 A air switch (Main blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB	CM110
	Grid Solution S.p.A. / Italy	S3C123/2000	CML
	Hapam B.V. / The Netherlands	SSBIII-123	HAC
123 kV, 2,000 A air switch with grounding blade (Main blade: Manually operated, Grounding blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB-E Special	CM210
	Grid Solution S.p.A. / Italy	S3CT123/2000	CML for DS and ES
	Hapam B.V. / The Netherlands	SSBIII-AM-123	HAC for DS and ES

Bid No. TS12-S-26

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7 พฤศจิกายน 2566

EGAT Accepted Multifunction Relay List

Manufacturer	Model	87L			21P			21BU			25			79			67			51			50BF			50EF			27/59			81			24			87K/87R/87C			87B (H)			87B (L)			60C (V)			60C (I)			Remark
		500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV																
GE	DRS																																																				
	P94Vx																																																				
	MIV																																																				
	P94V																																																				
	P143 (**)																																																				
SEL	SEL-311L																																																				
	SEL-411L (*)																																																				
	SEL-421 (*)																																																				
	SEL-311C																																																				
	SEL-387																																																				
	SEL-487E (*)																																																				
	SEL-587																																																				
	SEL-787 (**)																																																				
	SEL-587Z																																																				
	SEL-487B (*)																																																				
	SEL-501																																																				
	SEL-351A																																																				
	SEL-451 (*)																																																				
	SEL-751 (**)																																																				
	SEL-551																																																				
SEL-751A																																																					
Siemens	7SD52 (**)																																																				
	7SA522 (**)																																																				
	7SA6 Series (**)																																																				
	7SA87 (*)																																																				
	Duobias (**)																																																				
	7UT6 (**)																																																				
	7UT82 (**)																																																				
	7UT86 (*)																																																				
	7SS52 (**)																																																				
	7SS60																																																				
	7SS85 (*)																																																				
7VK6 Series (**)																																																					

เอกสารควบคุม
 รับรองสำเนาโดย ทพอ.ส.ภสศ.ส.อวส.
 ก่อนนำไปใช้งาน
 ต้องตรวจสอบ Revision ล่าสุด
 ฝ่ายวิศวกรรมระบบส่ง กฟผ.

Oct 2023

EGAT ACCEPTED FAULT RECORDING SYSTEM LIST

Accepted Type	Manufacturer
IDM+	Qualitrol
M871	GE
7KE85 (*)	Siemens
TESLA 4000 (*)	ERL Phase
TR 2100	Rochester (RIS)
TR 3000 (**)	

Remarks

- (*) Applicable to IEC 61850 for both station bus and process bus with the certification issued by the third party laboratory and specifying that the said FRS conforms to "IEC 61850 edition 2 parts 6, 7-1, 7-2, 7-3, 7-4, and 8-1".
- (**) Applicable to IEC 61850 only for station bus with the certification issued by the third party laboratory and specifying that the said FRS conforms to "IEC 61850 edition 2 parts 6, 7-1, 7-2, 7-3, 7-4, and 8-1".

Notes

- The procedures for being listed in EGAT ACCEPTED FAULT RECORDING SYSTEM LIST are specified in the EGAT's Pre-Qualification (PQ) process, of which the details can be provided by Transmission System Engineering Division on request.
- If any types of FRS in the list are planned to discontinue the manufacturing, the manufacturer or the representative is responsible for informing EGAT at least 1 year before the unavailable date.



เอกสารควบคุม

รับรองสำเนาโดย ทพอ-ส.กสส-ส.อวส.

ก่อนนำไปใช้งาน


ต้องตรวจสอบ Revision ล่าสุด

ฝ่ายวิศวกรรมระบบส่ง กฟผ.

EGAT ACCEPTED MANUFACTURER LIST FOR PROTECTIVE RELAY

Description	Manufacturer / Country
Protective Relay	ABB / Sweden, Switzerland, USA
	GE / USA, Canada, Spain, UK
	SEL / USA
	Siemens / Germany, UK
	Toshiba / Japan, Vietnam
	Schneider Electric / France, UK
	ZIV / Spain
	INGETEAM / Spain
	NR Electric / China
	Mitsubishi / Japan
	Protecta / Hungary
	Arcteq / Finland
	Sifang / China

Bid No. TS-25-26(R)



เอกสารควบคุม
 รับรองสำเนาโดย ทพอ-ส.กสส-ส.อวส.
 ก่อนนำไปใช้งาน
 ต้องตรวจสอบ Revision ล่าสุด
 ฝ่ายวิศวกรรมระบบส่ง กฟผ.

EGAT ACCEPTED MANUFACTURER LIST FOR FAULT RECORDING SYSTEM

Description	Manufacturer / Country
Fault Recording System	Qualitrol / UK
	Siemens / Germany
	Rochester / USA
	GE / USA
	ERL Phase / Canada

Bid No. TS12-S-26(R)

เอกสารควบคุม
รับรองสำเนาโดย **ทพอ-ส. กสส-ส. อวส.**
ก่อนนำไปใช้งาน
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ฝ่ายวิศวกรรมระบบส่ง กฟผ.

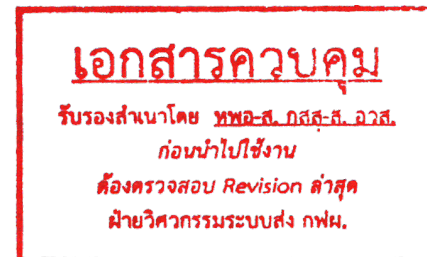
7 พฤศจิกายน 2566

EGAT ACCEPTED MANUFACTURER LIST FOR
CONTROL AND PROTECTION PANEL (LOCAL MANUFACTURER)

Description	Manufacturer	Designed by
500 kV Control and Protection Panel	Hitachi Energy (Thailand) Limited	Hitachi Energy (Thailand) Limited
	Precise System and Project Co., Ltd.	Precise System and Project Co., Ltd.
	U-tah Industry Limited Partnership	U-tah Industry Limited Partnership
	SCI Electric Public Company Limited	Siemens Limited
230 kV and below Control and Protection Panel	Hitachi Energy (Thailand) Limited	Hitachi Energy (Thailand) Limited
	C&T Metal Products Co., Ltd.	Easun Reyrolle Limited, India
	Precise System and Project Co., Ltd.	Precise System and Project Co., Ltd.
	U-tah Industry Limited Partnership	U-tah Industry Limited Partnership
	SCI Electric Public Company Limited	SCI Electric Public Company Limited
	Timpano Electrical Co., Ltd.	Timpano Electrical Co., Ltd.
	Mantra Switchgear Co., Ltd.	Siemens Limited

Notes

- The procedures for being listed in EGAT ACCEPTED MANUFACTURER LIST FOR CONTROL AND PROTECTION PANEL (LOCAL MANUFACTURER) can be provided by Transmission System Planning and Project Division on request.
- The control and protection panel shall be manufactured and designed by the manufacturer/company written in the same row.

7 พฤศจิกายน 2566

SCOPE OF WORK

H-1. General

<u>No.</u>	<u>Substation</u>	<u>Page</u>
1.	230/115 kV BAN BUENG 2 SUBSTATION (GIS)	
	- GENERAL	H1-1
	- ELECTRICAL PART	H1A-1
	- CONTROL AND PROTECTION PART	H1B-1
	- COMMUNICATION PART	H1C-1
	- CIVIL AND ARCHITECTURAL PART	H1D-1
2.	115 kV BAN BUENG SUBSTATION (GIS)	
	- GENERAL	H2-1
	- ELECTRICAL PART	H2A-1
	- CONTROL AND PROTECTION PART	H2B-1
	- COMMUNICATION PART (NONE)	-
	- CIVIL AND ARCHITECTURAL PART	H2D-1
3.	230 kV BO WIN SUBSTATION	
	- GENERAL (NONE)	-
	- ELECTRICAL PART (NONE)	-
	- CONTROL AND PROTECTION PART	H3B-1
	- COMMUNICATION PART (NONE)	-
	- CIVIL AND ARCHITECTURAL PART (NONE)	-

1. 230/115 KV BAN BUENG 2 SUBSTATION (GIS)

GENERAL

The new 230/115 kV Ban Bueng 2 substation with gas-insulated switchgear (GIS) is located in Tambon Ban Bueng, Amphur Ban Bueng, Chonburi Province.

The new 230 kV & 115kV GIS Ban Bueng 2 Substation are digital substation with breaker & a half scheme. They shall be installed inside the new separate GIS buildings.

The scope of work comprises two schedules as follows:

Schedule 1 : 230 kV Ban Bueng 2 Substation

The new 230 kV GIS shall have four (4) diameters with breaker & a half scheme for the following feeders:

- Two (2) feeders for 230 kV lines No.1 & 2 to Bo Win Substation.
- Two (2) feeders for 230 kV lines to future 230 kV Substation.
- Three (3) feeders for 300 MVA, 230/115-22 kV auto-transformers “KT1A, KT2A, KT3A”
- One (1) feeder for future 230 kV C-bank.

Schedule 2: 115 kV Ban Bueng 2 Substation

The new 115 kV GIS shall have six (6) diameters with breaker & a half scheme for the following feeders:

- Two (2) feeders for 115 kV lines No.1 & 2 to Ban Bueng Substation.
- Two (2) feeders for 115 kV lines to future 115 kV Substation.
- Three (3) feeders for 300 MVA, 230/115-22 kV auto-transformers “KT1A,KT2A, KT3A”
- Two (2) feeders for 115 kV lines to PEA.
- One (1) feeder for 115 kV line to future PEA.
- Two (2) feeders for 115 kV C-bank.

The contractor shall supply equipment, perform construction and installation work necessary for completion of operation substation in accordance with the contract documents. The design work shall include, but not limited to, technical calculation, preparation of drawings, bill of materials for installation and construction work. For accomplishment of complete operational substation, Scope of contractor's work shall include connection to all public utilities i.e.electrical power, water and drainage. Testing and commissioning of all equipment required to make the substation function properly.

Besides, all detailed engineering design work, calculations, drawing preparation, submission of backup data, test reports instruction books (and) ,etc. shall be included.

- 1) As stated elsewhere in these bidding documents, the drawings included in the bidding documents except drawing mark "For Construction" are for bidding purposes only and shall not be used for execution of the work.
- 2) The submitted drawings which are incomplete/unacceptable, or are the bidding document copies with minor modifications shall be returned unmarked to the contractor.
- 3) The drawings shall be furnished which provide all details required for thoroughly described equipment as well as installation methods and requirements. However, EGAT retains the right to request additional details if those furnished are perceived inadequate.
- 4) Calculations, backup data and documentation are required for all parts of the design. The furnished data shall verify completely that design is adequate for application purpose.

ELECTRICAL PART

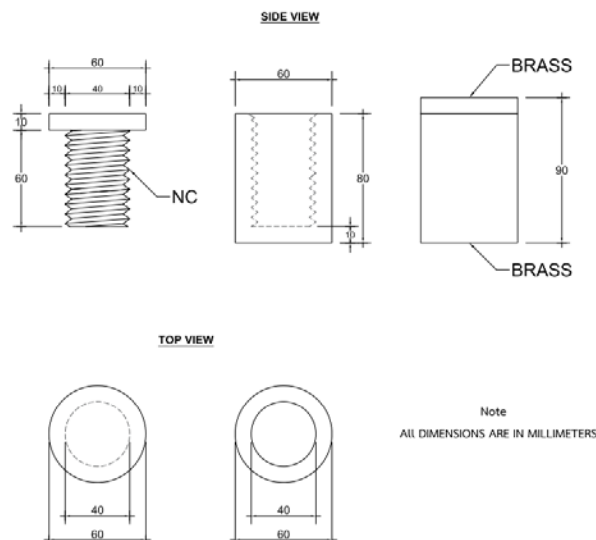
Schedule 1 and 2

Work included in this Contract.

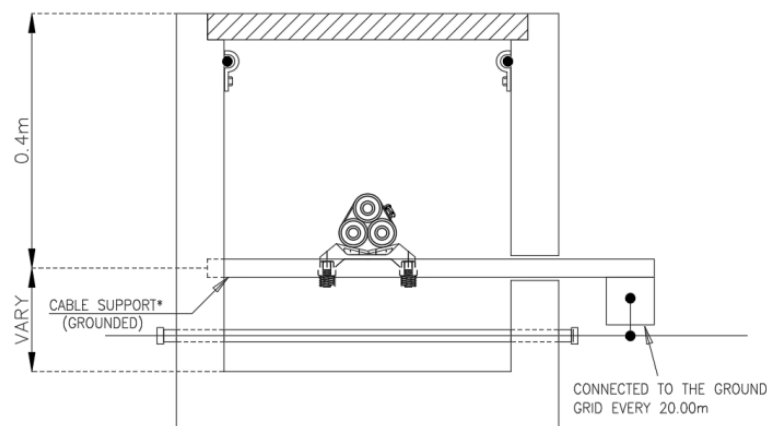
The work included in this contract to be performed by the contractor shall be as specified in the contract documents and as follows:

1. GIS Substation

- 1.1 Design, supply and installation of equipment required for a complete new 230 kV GIS substation.
- 1.2 Design, supply and installation of equipment required for a complete new 115 kV GIS substation.
- 1.3 Design, supply and installation of equipment required for a complete 22 kV power supply system.
- 1.4 Design, supply and installation of miscellaneous hardware required for the following:
 - 1.4.1 The connection between the 230 kV and 115 kV substations.
 - 1.4.2 The connection of 230 kV GIS air bushings and 115 kV GIS air bushings to the 300 MVA, 230/115-22 kV auto-transformers
 - 1.4.3 The connection of 230 kV GIS air bushings and 115 kV GIS air bushings to 230 kV & 115 kV overhead lines.
 - 1.4.4 The connection of 115 kV GIS air bushings to 115 kV C-Bank.
 - 1.4.5 The grounding equipment and miscellaneous hardware for the 300 MVA, 230/115-22 kV auto-transformers (KT1A, KT2A, KT3A)
- 1.5 To meet EGAT's service continuity requirements, the GIS gas compartment shall fulfill the requirements as specified in the specification.
- 1.6 Supply and installation of the marking pins for the referenced positions from the main bus shall be provided in the GIS buildings. The positions of the marking pins shall be shown on the drawings for future GIS extension and the quantity shall not be less than 4 sets. The marking pins shall be made of brass or stainless steel that have the formation as follows:



- 1.7 The GIB shall not be installed in multiple stacks for the purpose of convenient maintenance.
- 1.8 The detachable walk way (cat walk) for visual inspection shall be properly installed on each GIS module and removable service platform, removable ladder shall be provided for GIS inspection.
- 1.9 The feeder nameplates as well as phasing, device and switching numbers shown on the GIS module shall be painted or mounted (detachable type) on the enclosure of GIS. The nameplates color shall conform to Dwg. No.SE-ID-8-01 & SE-ID-7-01, and their sizes and locations shall be appropriate for GIS module.
- 1.10 The sag and tension of phase wires and overhead ground wires shall be calculated and designed according to internationally-accepted standards by the contractor and the said calculation shall be submitted to EGAT for approval.
- 1.11 Design, supply and installation of 22 kV XLPE cable system which comprises at least the following:
 - 1.11.1 The design and calculation of the 22 kV cable system shall conform to IEC and/or IEEE standards.
 - 1.11.2 The 22 kV XLPE cable shall be single-core with copper conductor.
 - 1.11.3 Design, supply and installation of the 22 kV XLPE cables in a 22 kV system complete from one end at the 22 kV bus to the station service transformers KW2A and KW3A, including cable trench, cable supporting structures, cable spacers, cable cleats, cable termination supporting structures, cable terminations, miscellaneous hardware and all related equipment.
 - 1.11.4 The minimum bending radius of the 22 kV XLPE cable shall be checked by contractor for cable installation and cable trench design.
 - 1.11.5 The 22 kV XLPE cable shall be installed in trefoil formation.

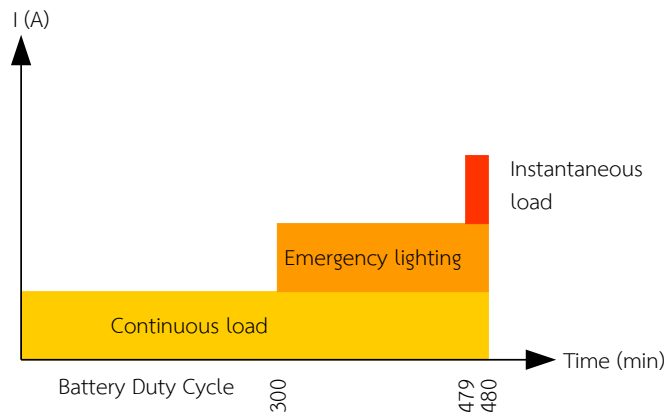


- 1.11.6 The contractor shall design and select the type of sheath bonding so that the 22 kV 1/C-35 sq.mm XLPE cable shall be able to carry the continuous current no less than 50A given that the ambient temperature is no less than 45 C° and the effect of solar heat shall be considered. The other parameters used in the design shall be practical, reasonable, operational and conform to IEC standard. The calculated continuous current rating shall be shown in the single-line diagram. The calculation shall be submitted to EGAT for approval.

- 1.11.7 The contractor shall calculate the sheath induced voltage in accordance with IEEE standard. The sheath standing voltage at every point on the metallic sheath of 22 kV XLPE cable system shall be less than 60 V under the rated continuous current. The cable jacket shall be properly designed to be protected from overvoltage. Determine the specification for a surge voltage limiter (SVL) and PGCC cable if deemed technically necessary. The design report shall be submitted to EGAT for approval.
- 1.11.8 Calculate the mechanical force due to short-circuit current as per IEC standard. Determine the specification for cable cleats. The design report shall be submitted to EGAT for approval.
- 1.11.9 Based on the design of 22 kV XLPE cable system aforementioned, the contractor shall provide detailed drawings for the installation of this cable system including all related components.

2. Station service system

- 2.1 Design, supply and installation of station service system complete with integral accessories to provide a complete system operation. The station service system mainly consists of as follows:
- 500 kVA, 22,000-400/230 V distribution transformer (KW2A)
 - 500 kVA, 22,000-400/230 V distribution transformer (KW3A)
 - Load Center Unit Substation (LCUS)
 - 22 kV drop-out fuses
 - 22 kV Load break switches
 - 600 V, 800A safety switches
 - 22 kV equipment, and AC&DC distribution boards, stationary batteries, battery chargers, power cables and all related equipment for the complete operation.
- 2.2 Design, supply and installation of equipment required for a complete 400/230 V power supply system.
- 2.3 Design, supply and installation of the stationary battery, in which the battery is capable of delivering power to the control and protection for tripping all circuit breakers, essential load for merging unit and emergency essential load for at least 8 hours if normal station service fails. The capacity of the battery shall not be less than 600 Ah. In case of bus faults occurring on the last hour of battery power, the battery shall generate sufficient power for tripping all circuit breakers as shown in figure below. The stationary battery shall be designed and calculated in accordance with IEEE or other acceptable international standards. In addition, the size of the stationary battery shall be designed to support the operation of existing and future bay as shown on the attached bidding document drawings. The calculation shall be submitted to EGAT for approval.



2.4 Emergency lighting system shall be installed at the control building, 230 kV GIS building and 115 kV GIS building in case of normal station service fails. The said emergency lighting system is activated and capable of generating illumination level of at least 150 LUX for at least 3 hours.

3. Grounding system

3.1 Design, supply and installation the grounding system of the following:

- 230 kV and 115 kV GIS substations
- 22 kV system
- 230 kV GIS building
- 115 kV GIS building
- Control building

3.2 The grounding conductor of the substation grounding system shall be 4/0 AWG bare copper wire type.

3.3 The contractor shall design, supply and install the conductor size 2x4/0 AWG bare copper wire type connect from ground grid to steel structure and equipment.

3.4 The ground grid conductor spacing under the building area shall be the same as the switchyard.

3.5 Design, supply and installation of the grounding system for isolating transformer. The grounding system of the isolating transformer shall be separated from the substation. The calculation shall be submitted to EGAT for approval.

3.6 Design, supply and installation of the grounding equipment and miscellaneous hardware for 230/115 kV system including the 22 kV power supply system and 22 kV XLPE cable system.

3.7 The contractor shall conduct the soil resistivity measurement. The result shall be submitted to EGAT for approval.

3.8 The contractor shall design a grounding grid based on the measured soil resistivity by hand calculation using the equations in IEEE-80 standard and submitted to EGAT for approval. The parameters for grounding system calculation shall be used as follows;

- Fault current division factor (S_f) value = 1
- Fault current (rms) = 40 kA
- Time duration of fault = 1 second

- The grounding conductor spacing for the grounding grid shall be 5.00m (D_0)
- The total number of ground rods shall be 250 pieces

These parameters shall be used for determine the size of grounding conductor for the substation grounding system. If the ground conductor spacing calculated by hand (D_1) is less than the grounding conductor spacing for reference (D_0), the contractor shall design a grounding grid by using the software. The certification of software shall be acceptable for commercial use.

4. Lightning protection system

4.1 Design, supply and installation of the substation lightning protection system complete with all related equipment. The contractor shall design the lightning protection system for the protection of all substation equipment which is under the protective zone. To meet EGAT's design criteria for the lightning protection system and to enhance the stability of lightning protection system, the Basic Insulation Level voltage (BIL) of:

- a) 900 kV for 230 kV substation.
- b) 550 kV for 115 kV substation.

shall be used in calculation instead of Critical Flashover voltage (CFO).

For 22 kV substation, the stroke current of 2 kA shall be used for the calculation.

4.2 For the design of lightning protection system for the control building and GIS buildings, the lightning protection level (LPL) shall be used level 1 for calculation and the overhead ground wire is not permitted. Air terminal rods installed at the roof shall be used instead.

4.3 Lightning protection system shall be designed to meet IEC, NEMA and E.I.T. standards or internationally-accepted standards.

5. Facility system

5.1 Outdoor facility system

5.1.1 Design, supply and installation of a substation lighting system complete with all integral accessories to provide a complete system operation. The lighting system shall mainly consist of equipment lighting, fence lighting, access road lighting, power box (PRB), sign board lighting, lighting relay panels (LRP), raceways and wiring cables for lighting circuits.

5.1.2 The lamps for outdoor facility lighting system shall be LED type with all integral accessories, e.g.lamp holders, fixtures, reflectors, and etc.The contractor shall provide drawings that show details for installation.

5.1.3 Design, supply and installation of circuits for remote control and door phone system of the main entrance gate. The control of the entrance gate shall be operated in both manual and remote-control modes which shall be controlled from both the control room and the guardhouse.

5.1.4 Design, supply and installation of circuits for remote control of the switchyard gate. The control of the switchyard gate shall be operated in both manual and remote-control modes which shall be controlled from both the control room and the guardhouse.

5.2 Indoor facility system

- 5.2.1 Design, supply and installation of the facility system which mainly consists of power supply, lighting system, lightning protection system, grounding system, power supply, fire alarm and protection system, air conditioning system, ventilation system and telephone & LAN system in the control building and GIS buildings. All cable wiring systems shall conform NEC and IEC standards or accepted international standards.
- 5.2.2 The lamps for indoor facility lighting system shall be LED type with all integral accessories, e.g. lamp holders, fixtures, reflectors, and etc. The contractor shall provide drawings that show details for installation and specify the LED lamp and LED luminaire circuit identified that the LED lamp circuit shall be supplied by 2 - 3 manufacturers.
- 5.2.3 All steel accessories e.g. lip-channel, conduit, conduit fittings, conduit accessories, box and cover shall be hot dip galvanized.
- 5.3 The size of low voltage cable shall be sufficient to keep the voltage drop at the load point less than 5% at rated current.
- 5.4 The voltage drop shall conform to EGAT's requirement and the calculation shall be submitted for approval.
- 5.5 The inverter for essential load of merging unit and emergency essential load shall meet the requirement as the table below. The contractor shall be responsible for inverter sizing calculation and the calculation shall be submitted to EGAT for approval.

No.	Description	Requirement data	Unit	No.	Description	Requirement data	Unit
1	Environmental Condition			6	Control button		
	1.1 Minimum ambient temperature	0	Celsius	6.1	Inverter START and STOP	YES	
	1.2 Maximum ambient temperature	40	Celsius	6.2	Acknowledge alarm silent	YES	
	1.3 Relative Humidity	0-95	%	6.3	Lamp test	YES	
	1.4 Tropicalization	YES	-	7	Measurement scale 90 degree		
	1.5 Altitude	<1000	meters	7.1	AC output voltage cls 1.5	YES	
2	Cabinet			8	Protection		
	2.1 Protection Level	IP 20		8.1	Overload shutdown	YES	
	2.2 Mounting	Removable		8.2	Low DC voltage shutdown (<105 V)	YES	
	2.3 Epoxy painting color	RAL7032		8.3	AC output fuse to prevent short circuit	YES	
	2.4 Convection ventilation	Forced air		8.4	Overload temperature shut down	YES	
	2.5 Steel sheet thickness	1.5	mm.	8.5	Thermistor fan controlled	YES	
					(Inverter will shut down when temperature		
3	Main supply Voltage			8.6	DC circuit breaker	YES	
	3.1 Nominal Voltage	125	V.	8.7	AC circuit breaker	YES	
	3.2 Voltage variation	100-150	V.	8.8	DC input fuse to prevent short circuit current	YES	
	3.3 Permissible ripple voltage on DC	< 5	% Vp-p	9	Monitor		
	3.4 Self-precharge	YES		9.1	Input DC voltmeter	YES	
4	Output AC Voltage			9.2	Output AC voltmeter	YES	
	4.1 Nominal voltage	220	V.	10	Alarm and LED lamp status Indicator		
	4.2 Supply system	1 ph+N		10.1	Inverter ON/OFF	YES	
	4.3 Static voltage regulation at 0-100% load variation and power factor 1.0	+/- 2	%	10.2	DC input status	YES	
	4.4 Dynamic voltage regulation	+/- 5	%	10.3	Load on inverter	YES	
	-At AC input fluctuation +/- 10 %			10.4	LED lamp alarm indicators (Alarm noise	YES	
	4.5 harmonic distortion	< 5	% THD	10.5	AC output status	YES	
	4.6 Output frequency	50	Hz		(LED shall blink when Under/Over voltage +/- 10		
	4.7 Frequency variable	+/- 0.5	%	11	Cable entry		
	4.8 Synchronized frequency	+/- 1	% Hz	11.1	DC incoming	YES	
5	Output capacity			11.2	AC Outgoing	YES	
	5.1 Output continuous capacity	xx	kVA	11.3	Terminal	INSIDE	
	Note xx : Design by Contractor						
	5.2 Overload capacity 100 % continuous	YES					
	5.3 Overload capacity 125 %	10	min				
	5.4 Overload capacity 150 %	1	min				
	5.5 Efficiency at rated load and 1.0 power factor	> 85	%				

6. Telecommunication system

6.1 Design, supply and installation of the telecommunication tower and cable ladder for telecommunication system by modifying the TELECOMMUNICATION TOWER "WSA" TYPE as shown in Dwg.No. UWC-06-WSA-501, 502, 503 &504 The said tower shall be constructed and divided into appropriate portions which are painted white and orange alternately with the top and bottom portions being painted orange. The obstruction lighting system shall be controlled by automatic flash box (AFB) that gives 30-60 flashes per minute. The AFB shall be turned on and turned off by a photo-light switch. The lightning protection for the telecommunication tower shall be calculated and designed by the contractor and the said calculation shall be submitted to EGAT for approval.

7. Other work

- 7.1 Installation of suspension and post insulators and all hardware for suspension and post insulator assembly.
- 7.2 Installation of heat shrinkable insulation material for 22 kV aluminum conductor between 22 kV drop-out fuses and cable terminations.

- 7.3 Modification of junction box supporting structure (JB001) for the installation of safety switches and power box (PRB).
- 7.4 Modification of junction box supporting structure (JB003) for the installation of outdoor receptacle box (ORB1 and ORB3).
- 7.5 Modification of bus support structure (BS203) for the installation of 22 kV voltage transformers and junction box (PT6)(Design by contractor).

8. Testing and commissioning

- 8.1 Testing and commissioning of all equipment required to make the substation function properly.

Work not included in this Contract

The Work not included in this contract shall be as shown on the drawings and as follows:

1. The stringing work for the connection between the 230 kV substations take-off structures and the dead-end towers of the transmission lines.
2. The stringing work for the connection between the 115 kV substations take-off structures and the dead-end towers of the transmission lines.
3. Supply and installation of 230/115-22 kV auto-transformers “KT1A, KT2A, KT3A” except supply and installation of cabling work for control and protection system.
4. Supply and installation of 115 kV C-Bank except supply and installation of cabling work for control and protection system.
5. Supply station post and suspension insulators.

CONTROL AND PROTECTION PART

Schedule 1 and 2

Work included in this Contract

1. Design, supply, installation, wiring, test and commissioning of complete control and protection system based on the IEC 61850 standard which comprises at least the following equipment:

For Process Level

- Merging Unit Cabinet
- 400/230 VAC, 125VDC power panel and distribution boards

For Bay Level

- Protective IED panel (swing-rack type)
- Bay Control Unit (BCU) panel (swing-rack type)
- Metering panel (swing-rack type)
Each energy meter shall be calibrated by EGAT's Energy Meter Department before being installed in each metering panel.
- Ethernet switch panel for station bus (19" rack type)
- Ethernet switch panel for process bus (19" rack type)
- E1 converter panel (19" rack type)
- EGAT-PEA interfacing panel (19" rack type)
- Fault Recording System (FRS) panel (19" rack type)
- 400/230 VAC, 125 VDC power panel and 125 VDC distribution boards

For Station Level

- GPS receiver and gateway panel (19" rack type)
- Outdoor antenna and accessories
- HMI and accessories
- Engineering workstation (EWS) and accessories
- Redundant UPS systems to power HMI and EWS
- Complete set of operator console and chair
- 400/230 VAC, 125 VDC power panel and 125 VDC distribution boards

For loose part

- Optical fiber cables, copper cables, patch cord cables and accessories as well as connection of cables among all of the boards and the associated equipment in order to complete the function of the control and protection system.
- EFLEX conduits for optical fiber cables inside/outside buildings
Outdoor optical fiber cables shall be wired in EFLEX conduits laying in cable trench as per drawing no. TP-E-20.13.
- Loose equipment as specified in price schedule.

2. Design, supply, installation, wiring, test and commissioning of complete operator console, engineering workstations, HMIs, gateways, and all required system software and hardware in order to successfully run IEC 61850 based substation protection and automation system together with the existing EGAT's SCADA system which at least consists of National Control Center (NCC), Backup National Control Center (BNCC), Regional Control Center (RCC), Backup Regional Control Center (BRCC), Group Control Center (GCC), and Backup Group Control Center (BGCC). In addition,

IEC61870-5-104 is used for EGAT's SCADA system. HMIs and engineering workstation shall be of the separated industrial desktop computers running on the latest licensed Microsoft Windows operating system with the licensed antivirus program.

3. The System Integrator (SI) shall be responsible for at least the following scope of works:

- Design the complete IEC 61850 based substation protection and automation system as well as the communication network based on IEC 61850 standard in order to coordinate with the existing equipment and/or equipment supplied by EGAT.
- Configure each IED and communication network in order to completely fulfill the designed IEC 61850 based substation protection and automation system.
- Design the engineering workstation, HMIs, gateways and all required system software in order to successfully run the IEC 61850 based substation protection and automation system. In addition, the signal lists to be displayed/controlled via engineering workstation, HMIs and the remote EGAT's SCADA shall be discussed with EGAT after the Award of Contract.
- Perform at least the following tests:

- o Individual test

This test is to verify each IED performance which shall comply with EGAT's Specifications as well as the relevant drawings and documents. In addition, the internal logic of each IED shall be adapted according to EGAT's comments in case the IED performance does not fulfill EGAT's requirements.

- o Service setting test

This test is to find out the proper setting values for all IEDs. The calculation report using the given data which will be provided after the Award of Contract shall be done by SI and submitted to EGAT for approval before configuring to all IEDs.

- o Factory Acceptance Test (FAT)

This test is to verify system performance with configured IEDs which shall comply with EGAT's Specifications as well as the relevant drawings and documents.

- o Site Acceptance Test (SAT)

This test is to finally verify the complete IEC 61850 based substation protection and automation system with the existing equipment and/or equipment supplied by EGAT at site which the system performance shall comply with EGAT's Specifications as well as the relevant drawings and documents. In addition, the test will be under EGAT's supervision.

All test reports shall at least clearly show the following details:

- o Test procedures
- o All used data such as parameters, standards, and etc.
- o Test results
- o Conclusion

In addition, all tests shall be witnessed by EGAT's staff. Moreover, EGAT shall have access to all necessary data for complete understanding of the tests as well as the validity of the results.

4. The Contractor shall be responsible for providing both hardcopies and electronic files of the complete schematic and wiring diagrams of the IEC 61850 based substation protection and automation system including programmable logic schemes of each IED, programmable logic schemes of parallel transformer (if any), HMI graphic display, SSD files, ICD files, SCD files, CID files, signal lists of SV, GOOSE and MMS, and communication network connection diagram. Moreover, the required software for the above-said SCL files configuration shall also be supplied. In case of the SCD file configuration, the supplied software shall be compatible with all IEDs operated in the substation and shall also support multi-vendor IEDs. In addition, the Contractor can use the substation system network topology on drawing no. TP-E-20.3 as a guideline. The said drawing can be modified by the Contractor. However, it shall be submitted to EGAT for approval.
5. The Contractor shall be responsible for providing both hardcopies and ACAD files of the complete schematic and wiring diagrams of the interfacing work between IEC 61850 based substation protection and automation system and the existing equipment and/or equipment supplied by EGAT. In addition, the approved final revision of green-red drawings and final drawings shall be printed and submitted in A1 paper size.
6. The Contractor shall provide the draftsman working at the site during the commissioning stage in order to be in charge of writing the as-built drawings of control and protection system.

COMMUNICATION PART

Schedule 1

Work included in this Contract.

1. Design, supply, and installation of the substation CCTV system which complies with the following qualifications:
 - 1.1 The system can be operated 24 hours a day.
 - 1.2 All cameras in the system shall be IP-camera type.
 - 1.3 At least 2 monitoring locations are required, the guardhouse and the control room.
 - 1.4 Installation space in the control room shall be prepared for rack cabinet(s) and CCTV operation desk(s) positions.
 - 1.5 In case of outdoor installation, all devices shall be weather-proof type which can be operated in all outdoor weather conditions, robust and durable.
 - 1.6 The bidder or a subcontractor shall be authorized by a representative or a branch office of manufacturer in Thailand.
 - 1.7 The bidder or a subcontractor shall be able to supply the spare parts of CCTV equipment in this contract for at least five (5) years starting from the date of EGAT acceptance.
 - 1.8 The calculation and required drawing according to the attached Bidding Document Specification shall be submitted to EGAT for approval.

CIVIL AND ARCHITECTURAL PART

Schedule 1

Work included in this Contract.

ARCHITECTURAL WORK

1. Design and construction of

1.1 230 kV GIS Building

- 1.1.1 Structure & foundation. The proper structure can be selected for the design and construction and shall be submitted to EGAT for approval.
- 1.1.2 RC and/or steel structure for roof.
- 1.1.3 Fire protection for steel structure shall conform to legal provision, EGAT's specifications and Design manual for substation. Therefore, Fire protection for steel structure specification in Architecture drawing shall be cancelled
- 1.1.4 Architectural of the whole building.
- 1.1.5 The contractor shall construct the building conformed to "IEEE STD-979- 1994 (R2004)" (IEEE Guide for Substation Fire Protection)
- 1.1.6 230 kV GIS Building shall be designed with reference to Standard 230 kV GIS Building (Dwg.No.SD-GIS-8-01A) Equipment layouts and cable block out shall conform to electrical drawing Dwg.no.SE-GIS-0-01-01/01 and Dwg.No.BBG2-S-2 and Dwg.No.BBG2-S-6. Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.
- 1.1.7 The design of building shall analyze and take the following aspects into consideration: Site, Environment, Context, Function, Climate (sunlight, wind, rain, heat etc.), Energy efficiency, Safety and including aesthetic of architecture to encourage EGAT corporate identity.
- 1.1.8 For exterior surface of the building, there shall be at least 20% of total building area which uses yellow color that represents corporate image of EGAT.
- 1.1.9 Building facilities
 - Electricity and illumination system including cable work for illumination, ventilation system, power supply, and telephone system.
 - Storm water drainage system.
 - Miscellaneous including grounding and labeling.
 - Cable routing and cable support (cable tray and cable ladder) installed in main cable trench.
 - Overhead traveling crane, of lifting capacity not less than 7.5 metric tons and wireless crane remote control. Overhead traveling crane shall have cat-walk for maintenance the equipment on ceiling and complete with 2 sides of guard rail along the cat-walk.
 - Overhead traveling crane shall comply with standard DIN EN 15011 standard.

- Overhead traveling crane motors shall be dual speed or inverter and have operation speed as below.

Operating speed	High speed	Low speed
Cross travel	20 m/min	5 m/min
Long travel	32 m/min	5 m/min
Lifting	5 m/min	0.8 m/min

- Overhead traveling crane shall be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation.
- Signboard on building.
- Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).

1.2 230/115 kV Control Building.

1.2.1 Structure & foundation. The proper structure can be selected for the design and construction and shall be submitted to EGAT for approval.

1.2.2 RC and/or steel structure for roof.

1.2.3 Fire protection for steel structure shall conform to legal provision, EGAT's specifications and Design manual for substation. Therefore, Fire protection for steel structure specification in Architecture drawing shall be cancelled.

1.2.4 Architecture of the whole building.

1.2.5 The contractor shall construct the building in accordance with "IEEE STD- 979-1994 (R2004)" (IEEE Guide for Substation Fire Protection).

1.2.6 230/115 kV Control Building shall be designed with reference to Standard Control Building (Dwg.No.SD-CD-0-01A.) Equipment layouts and cable block out shall conform to electrical drawing (Dwg.No.BBG2-S-6). Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.

1.2.7 The design of building shall analyze and take the following aspects into consideration: Site, Environment, Context, Function, Climate (sunlight, wind, rain, heat etc.), Energy efficiency, Safety and including aesthetic of architecture to encourage EGAT corporate identity.

1.2.8 For exterior surface of the building, there shall be at least 20% of total building area which uses yellow color that represents corporate image of EGAT.

1.2.9 Building Facilities

- Electricity and illumination system including cable work for illumination, ventilation system, power supply, air conditioning system, and telephone system.
- Plumbing system for water supply, building drain and vent, storm water drainage including sanitary wares and fittings.
- Miscellaneous including grounding and labeling.
- Cable routing and cable support (cable tray and cable ladder) installed in cable room and main cable trench.

- Access floor system or Raised flooring system (For walking area)
 - Panels shall be capable of supporting concentrated load not less than 500 kg. A uniform load or distributed load not less than 1,500 kg/sq.m.
 - Floor panels shall consist of calcium-sulphate have protection against humidity, rotting and fire panels shall be jig-milled to thickness size.
 - *Thickness: not less than 35 mm.
 - *Module : 600x600 mm. or 24x24 Inches
 - Finish the surface of the floor panels with floor covering material indicated mineral panels with High Pressure Laminated (HPL) shall be not less than 1.5 mm. from manufacturer standard.
 - Panels' material shall be non-combustible, fire retardant, or the fire-resistant building material class A, with galvanized steel plate covering both on the top and bottom of the panel.
 - The understructure system of access floor such as pedestal profile, Stringer, head plate and steel bolt shall be made of Electroplated Galvanized Steel (ASTM A879)
 - The system frame areas which are fixed to the current system by bolting and adhesive shall be unwelded connection.
 - The access floor system, following standard:
 - *Load test: EN 12825 or CISCA
 - *Fire test: DIN4102: F30 A or ASTM E84 Class A or BS476 part 4 Class A
 - The test report shall be certified by a third-party accredited laboratory.
 - The pattern of access floor (Walking area) relating to cable route and equipment layout shall be submitted to EGAT for approval.
 - All components of access floor system, which consist of floor panel, stringer, pedestal, and other part, shall be manufactured by the same manufacturer.
 - With 10 years guarantee of material and 2 years installation.
 - The access floor system material in the Specification No.3001 (Civil and Architectural work) No.3001-10.8.3.5 Access Floor System (Raised Flooring System) and the referenced drawings of the said material shall be cancelled.
- Signboard on building and room name sign on each room.
- Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).
- Furniture as specified in Architectural Drawings not included in this contract except as the following:
 - Complete set of pantry storage side board that consists of base cabinet and wall hanging cabinet, including one stainless sink tap and full set of pantry accessories.

2. 3D Animation Specification

(1) 3D Animation Requirement

- a) A video of walk-through substation 3D animation. The video shall be not less than 3 minutes length, the resolution shall be not less than 4K (3840 x 2163 pixels) with a frame rate of 60 fps, have an MP4 H.264 file type. The video shall also show these details.
 - Substation's name, in both Thai and English
 - A clear view of substation's entrance and signboard
 - Normal-eye-view (normal perspective) exterior scenes of the whole substation, including every building and electrical equipment
 - Bird 's-eye-view exterior scenes of the whole substation, including every building and electrical equipment
 - Normal-eye-view (normal perspective) interior scenes of every building in the substation, such as control room, GIS area, electrical room, relay room, switchgear room, etc.
 - Bird 's-eye-view interior scenes of GIS area, and any other rooms
- b) All relate 3D files used to create the 3D animation, both in their respective original file types and being exported as SketchUp (SKP) files

(2) 3D Animation Video Specification

- a) The contractor shall make use of any software with a software copyrights.
- b) A music, which is not subjected to copyrights, shall be added into the 3D animation.
- c) The contour, landscape and surrounding of the substation in the 3D animation shall also be created, based on the real existing surrounding.
- d) A model used to create the 3D animation shall follow these details:
 - Any components with a size of 0.008 cubic meters, or more, shall be created as a 3D model
 - All models shall be texture-mapped, with a color and texture close to the real surface of the material, equipment, or building they are based on.
 - The 3D animation shall make use of the renderings systems along with the ray tracing system to create a realistic light, in accordance to the real sun positioning in Thailand.

WATER SUPPLY AND FIRE PROTECTION SYSTEM

3. Design and construction of

3.1 Fire protection system for 230 kV GIS Building.

- 3.1.1 GIS Building shall consist of optical beam smoke detector and linear heat detector.
- 3.1.2 Fire protection system of GIS Building shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected device, shown and recorded at control

room in 230/115 kV Control Building. The installation practice shall be in accordance with the last edition of NFPA 72.

- 3.1.3 There shall be sounder and beacon on the roof of the building.
- 3.1.4 Fire protection system, fire alarm system and accessories shall be in accordance with the applicable requirements set forth in the latest edition of the following codes and standards:
 - NFPA 70 : National Electrical Code.
 - NFPA 72 : National Fire Alarm Code.
 - NFPA 75 : Standard for the Fire Protection of Information Technology Equipment.
 - NFPA 76 : Standard for the Fire Protection of Telecommunications Facilities.
 - IEEE Std 979: IEEE Guide for Substation Fire Protection
 - NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations

3.2 Fire protection system for 230/115 kV Control Building.

- 3.2.1 Control Building shall consist of Total Flood Clean Agent Fire Suppression System with heat detector, addressable type smoke detector and aspirated smoke detector.
- 3.2.2 Fire protection system of Control Building shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected device, shown and recorded at control room in 230/115 kV Control Building. The installation practice shall be in accordance with the last edition of NFPA 72.
- 3.2.3 There shall be sounder and beacon on the roof of the building.
- 3.2.4 For system requirements for indoor fire protection system as shown on specification 3001-10.13.1 part e, item no.1 and 6 shall be changed to the new details as follow

(1) System description and operation : Supply and Installation of a Total Flood Clean Agent Fire Suppression System utilizing IG-100 shall cover all these zones :

Zone 1: Equipment (Control/Relay) Room ;

Zone 2: Electrical Room ;

Zone 3: Under Raised Floor (If Required);

Zone 4: Battery Room ;

Zone 5: Cable Room (If required) ;

Zone 6: Inert Gas Room

Other zone (If required)

Each protected zone shall have its own set of IG-100 cylinders.

(6) Detectors shall be cross-zone detection requiring 2 detectors to be in alarm before discharge. A zone of A or B of addressable smoke detector and a zone C of all ASD shall be crossed.

3.2.5 For air sampling smoke detector as shown on specification 3001- 10.13.2 part i item no.1, 7, 13 and 14 shall be changed to the new details as followings :

i. Air Sampling Smoke Detector.

(1) Shall consist of a high sensitivity type detector, using light scatter technology.

(7) Detection system for all cabinet shall be omitted.

(13) The minimum sensitivity settings for a single sampling hole are so that the detection system alarm at 1.5%obs/ft(4.95%obs/m).A sampling hole maximum coverage area is 400.0 sq.ft (37.2 sq.m).

(14) Maximum transport time from the most remote port to the detection unit of an air-sampling system shall be a maximum of 90 seconds.

3.2.6 Fire protection system, fire alarm system, installation room and accessories shall be in accordance with the applicable requirements set forth in the latest edition of the following codes and standards:

- NFPA 2001: Clean Agent Fire Extinguishing Systems.
- NFPA 70 : National Electrical Code.
- NFPA 72 : National Fire Alarm Code.
- NFPA 75 : Standard for the Fire Protection of Information Technology Equipment.
- NFPA76 : Standard for the Fire Protection of Telecommunications Facilities.
- IEEE Std 979 : IEEE Guide for Substation Fire Protection
- NFPA 850 : Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations.

3.2.7 There shall be one control panel which controls fire detection system and IG-100 fire suppression system in the building.

3.2.8 There shall be a protective clear polycarbonate cover which can be immediately lifted or opened for all IG-100 manual release stations.

3.2.9 Battery room shall be furnished with an all-stainless steel, wall-Mounted emergency eyewash. Contractor shall submit the catalog and proposed location of the eyewash to EGAT for approval.

3.3 Fire protection system for the switchyard to meet the requirement as specified in IEEE Guide for Substation Fire Protection: IEEE Std 979, all requirements of NFPA 850.

3.4 Fire protection system for the Transformer : The Foam-water spray system shall comply with the following;

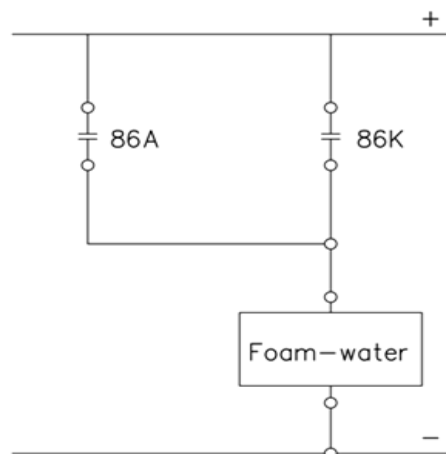
3.4.1 Foam-water spray system: NFPA 13, NFPA16 & NFPA 850

3.4.2 Bladder tank vessel construction standards : Carbon steel to ASME code section VIII for unfired pressure vessel.

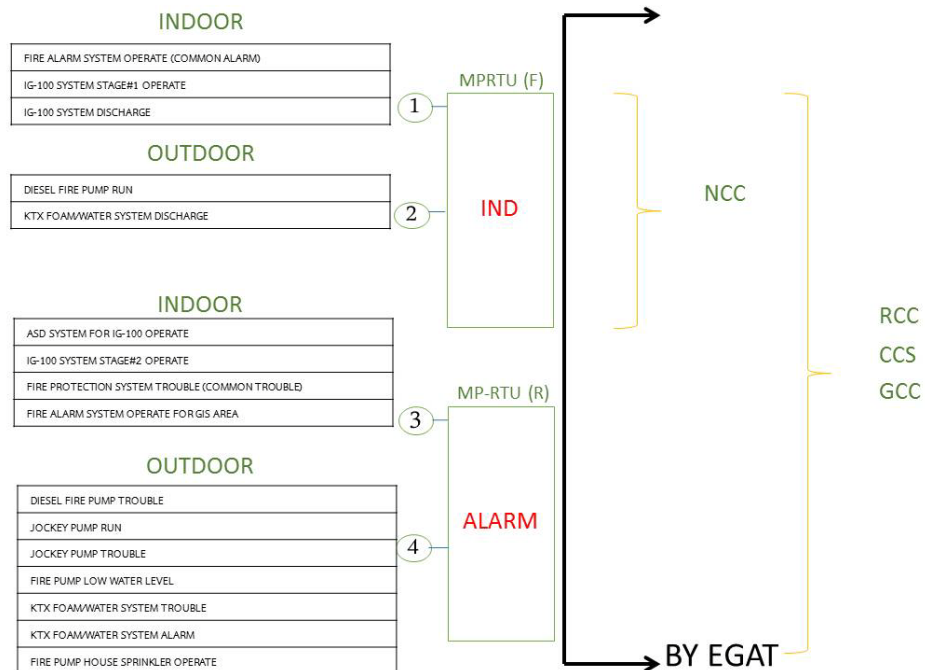
3.4.3 Nozzles : NFPA 16 and as per Manufacturer's Recommendation

- 3.4.4 Detection system : Air Expansion Linear Heat Detection System (LHB)
- 3.4.5 Equipment for system : FM approved, UL Listings , Vds
- 3.4.6 Foam-water spray system provided for Transformer shall be designed for a density of 10.2 litre/min-sq.m over the exposed surface at the Transformer.
- 3.4.7 There shall be one linear heat detector box for each transformer.
- 3.4.8 There shall be one control panel for fire detection and foam/water spray system which controls all foam/water spray system of all protected transformers.
- 3.5 Fire Pump System. (conforming to NFPA 14, 20, 22, 24, 72).
- 3.6 250 cu.m water storage tank, fire pump, and jockey pump shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected devices, shown and recorded at control room in 230/115 kV Control Building. The installation practice shall be in accordance with the latest edition of NFPA 72.
- 3.7 There shall be one fire alarm system graphic annunciator at each building to enable responding personnel to identify the location of a fire accurately and to indicate the status of emergency equipment or fire safety functions.
- 3.8 There shall be one graphic annunciator which displays alarm, discharge and trouble signals of fire alarm system of other buildings, (fire pump houses, transformers, shunt reactors) at the building where control room locates.
- 3.9 Fire protection system circuits for buildings and switchyards : notification appliance circuits , and signaling line circuits , shall be class A circuit. Initiating device circuits can be class B circuit.
- 3.10 For Control System Logic as shown on specification 3001-13.4 item 4.1 shall be changed to the new detail as following

(4.1) In case of fire, heat detector and the tubular expansion detector first give alarm. If rate of rise/fixed temp in heat detector/tubular expansion detector sense fire condition, there shall be alarm in control room and the detected transformer shall be tripped before applying Foam-Water spray as the condition shown in the diagram below ;



- 3.11 Signals of indoor fire protection system of each room and signals of outdoor fire protection system of each transformer shall be sent to local CCS, GCC, RCC, and NCC as following details;



- 3.12 There shall be only one subcontractor engaging in design, supply and installation of Fire Protection System for Buildings and Switchyard.
- 3.13 Water supply system.
- 3.14 All building wall openings for fire protection dampers shall be provided with stainless steel louvers and insect screens to install inside of building.
- 3.15 For portable fire extinguisher as shown on specification 3001- 10.13.3 shall be changed to the new details as followings :
- The fire extinguishers shall be conformed to latest TIS standards. The portable and mobile fire extinguishers shall be carbon dioxide (CO₂) conforming to TIS 881 and/or dry chemical conforming to TIS 332 , capacity 10 lbs/set. The fitting accessories shall be provided.
 - The portable fire extinguishers shall be installed according to the latest NFPA 10.
- 3.16 There shall be safety signs for fire extinguisher, manual release station and fire alarm device.
- 3.17 Fire protection system work shall be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation.
- 3.18 There shall be a set of computer desk with chair, a set of CPU which suitable for fire protection system software and operate 24 hours a day and a set of 24" LED monitor which show the status of fire protection system in control room in 230/115 kV Control Building. One set of laser jet printer shall be provided.
- 3.19 Consumable materials for fire protection system, for example, filters, liquids, and seals shall be provided according to manufacturer's instructions for a period of two years.

- 3.20 For all buildings, piping or cable penetrating the wall/floor and block out at wall/floor shall be enclosed with fire stop material. Fire stop material shall be approved by UL Listed/FM Approved and comply with NFPA 80 (Standard for Fire Doors and Other Opening Protectives) and other relevant standards. The installer shall be certified by manufacturer and have experience in installation of material for at least 5 years, of at least 10 projects.
- 3.21 Fire detection devices in substation shall be as table below.

Protected Area	Detector
1. Control, Relay and Telecommunication Rooms	ASD and SD
2. Under-Raised Floor	ASD and SD
3. Feeder Sections and Switchgear areas	ASD and SD
4. Electrical Room	ASD and SD
5. Battery room	
5.1 Battery room Vented Type	HD
5.2 Battery room Dry Type	HD
6. GIS Area	OBSD
7. Inert Gas Room	SD
8. Other Room such as Shops, Office, Warehouse and Pantry	HD or SD
9. Emergency Diesel generator room or Emergency Generator Set House	HD
10. Transformer, Shunt Reactor	LHD
11. Cable Spreading Rooms and Cable Tunnels	<ul style="list-style-type: none"> ▪ SD when environmental condition is acceptable. ▪ LHD when environmental condition is out of range for SD ▪ ASD in high risk area and required early response.
12. Main Cable Trench of GIS Area	LHD

Abbreviations

1. Heat detector, HD
2. Addressable Spot-Type Photoelectric Smoke detector, SD
3. Linear Heat Detector, LHD
4. Aspirated smoke detectors, ASD
5. Optical beam smoke detector, OBSD

- 3.22 Pipe coating system shall conform to ASME A13.1 standard and ANSI-A13.1
- 3.23 Underground water piping shall have indicator sign.
- 3.24 For Fire protection system design shall be conformed to NFPA 101 (Life Safety Code).
4. Construction of
- 4.1 Foam house.
 - 4.2 Fire pump house.

- 4.3 Cabinets with 2x50 lbs wheel fire extinguisher.
- 4.4 Water storage tank for fire protection system (capacity not less than 250 cu.m).

CIVIL WORK

- 5. Design and construction of
 - 5.1 Steel structure and foundations for Specified equipment and the others not shown in “For Construction drawings” and / or EGAT’s specification.
 - 4.1.1 230 kV GIB & GIS bushing structure and foundation.
 - 4.1.2 Load break switch structure foundation.
 - 5.2 Cable trench 1.80 m. width
 - 5.3 Road and drainage system.
 - 5.4 Drainage system for cable trench.
 - 5.5 Oil containing pit with steel grating and black steel spiral-seam pipes (TIS 427-2531) with protection method according to AWWA C217, C205.
 - 5.6 Remote control (shall be controlled from either the control room or the guard house) and door phone system for main entrance gate.
 - 5.7 Three minutes 3D animation presentation file (MP4, resolution not less than 1440 p; 2500 x 1440) demonstrating details of switchyard and interior and exterior buildings shall be arranged.
- 6. Construction of
 - 6.1 Telecommunication tower foundation.
 - 6.2 Steel structure foundation.
 - 6.3 Take-off foundation.
 - 6.4 Equipment structure foundation with sub trench (if required).
 - 6.5 Dead man hook for loading transformer
 - 6.6 Transformer loading.
 - 6.7 Cable trench.
 - 6.8 RC. Road.
 - 6.9 Oil separator.
 - 6.10 Crushed rock surfacing.
 - 6.11 Wire mesh fence.
 - 6.12 Lamp post for fence and access road lighting LED type foundation.

7. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.
8. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.
9. All design, construction and testing shall be in accordance with Specification No.3001 : Civil and Architectural Work.

Floor Loading for building.

Minimum floor loading of substation shall be as follow:

a. GIS room and Switchgear room	2,000	kg/sqm
b. Control and communication room	1,250	kg/sqm
c. Removable raised floor	1,700	kg/sqm
d. Station battery room	1,600	kg/sqm
e. Cable laying floor	600	kg/sqm
f. Conference room	500	kg/sqm
g. Living, Office, Toilet etc.	300	kg/sqm
h. Platform area for GIS	2,000	kg/sqm
i. Platform area for Control and Communication	1,700	kg/sqm
j. Inert gas storage area	1,200	kg/sqm
k. Roof deck	200	kg/sqm
l. Storage area for warehouse	800	kg/sqm
m. Electrical room	1,700	kg/sqm

10. Bored hole for soil investigation shall conform to Specification No. 3001. The position shall be submitted to EGAT for approval.
11. EGAT's Soil Investigation Report (attached to the Contract) is a document that can be a reference for bidding, however; the review of the soil investigation report shall be under responsibility of the Contractor and the warranty of work shall remain following all obligations as specified in the Contract.
12. In case of soil layer is soft clay, consolidation test shall be performed from clay of one bored hole only. The position shall be submitted to EGAT for approval.
13. All foundations shall be as specified in layout drawing. Except the result of soil investigation shows that the specified foundations are not appropriate, the Contractor shall design the proposed foundations.
14. The Contractor shall perform a static load test for 230 kV GIS Building foundations in accordance with ASTM D1143 (if pile type foundation is required).

15. Dynamic load test (DLT) according to ASTM D4945-89 shall be applied to at least 2% of driven piles (if driven pile type is required) except for driven pile of fence and lamp post.
16. Seismic load test (sonic integrity test) according to ASTM D5882-96 shall be applied to all bored piles (if bored pile type is required).
17. Plate bearing test according to ASTM D1194-94 shall be submitted to EGAT for approval (if pad type foundation is required).
18. The Contractor shall remove all debris from construction material and other works in order to make the site clean and be in the condition acceptable to EGAT.
19. According to the Contract Document Section G-3 : Contractor's Office and Other Construction Facilities; the detail in paragraph 3 shall be changed as follows : the Contractor shall provide for EGAT an office container at the site during construction with a minimum space of 36 sq.m for office area, 24 sq.m for conference room which shall both be air-conditioned and 4 sq.m for toilet. The facilities as shown on the section G-3 are required for 2 sets.

Schedule 2

Work included in this Contract.

ARCHITECTURAL WORK

1. Design and construction of
 - 1.1 115 kV GIS Building.
 - 1.1.1 Structure & foundation. The proper structure can be selected for the design and construction and shall be submitted to EGAT for approval.
 - 1.1.2 RC and/or steel structure for roof.
 - 1.1.3 Fire protection for steel structure shall conform to legal provision, EGAT's specifications and Design manual for substation. Therefore, Fire protection for steel structure specification in Architecture drawing shall be cancelled
 - 1.1.4 Architectural of the whole building.
 - 1.1.5 The contractor shall construct the building conformed to "IEEE STD- 979- 1994 (R2004)" (IEEE Guide for Substation Fire Protection)
 - 1.1.6 115 kV GIS Building shall be designed with reference to Standard 115 kV GIS Building (Dwg.No.SD-GIS-7-01A) Equipment layouts and cable block out shall conform to electrical drawing Dwg.no.SE-GIS-0-01-01/01 and Dwg.No.BBG2-S-2 and Dwg.No.BBG2-S-6. Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.
 - 1.1.7 The design of building shall analyze and take the following aspects into consideration: Site, Environment, Context, Function, Climate (sunlight, wind, rain, heat etc.), Energy efficiency, Safety and including aesthetic of architecture to encourage EGAT corporate identity.
 - 1.1.8 For exterior surface of the building, there shall be at least 20% of total building area which uses yellow color that represents corporate image of EGAT.

1.1.9 Building facilities.

- Electricity and illumination system including cable work for illumination, ventilation system, power supply, and telephone system.
- Storm water drainage system.
- Miscellaneous including grounding and labeling.
- Cable routing and cable support (cable tray and cable ladder) installed in main cable trench.
- Overhead traveling crane, of lifting capacity not less than 5 metric tons and wireless crane remote control. Overhead traveling crane shall have cat-walk for maintenance the equipment on ceiling and complete with 2 sides of guard rail along the cat-walk.
- Overhead traveling crane shall comply with standard DIN EN 15011 standard.
- Overhead traveling crane motors shall be dual speed or inverter and have operation speed as below.

Operating speed	High speed	Low speed
Cross travel	20 m/min	5 m/min
Long travel	32 m/min	5 m/min
Lifting	5 m/min	0.8 m/min

- Overhead traveling crane shall be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation.
- Signboard on building.
- Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).

WATER SUPPLY AND FIRE PROTECTION SYSTEM

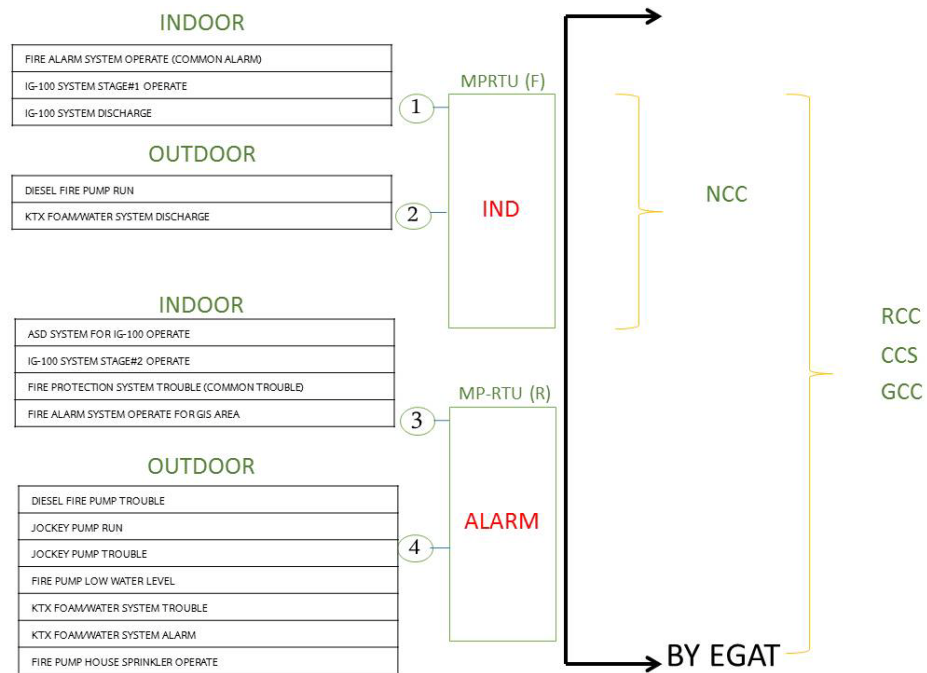
2. Design and construction of

2.1 Fire protection system for 115 kV GIS Building.

- 2.1.1 GIS Building shall consist of optical beam smoke detector and linear heat detector.
- 2.1.2 Fire protection system of GIS Building shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected device, shown and recorded at control room in 230/115 kV Control Building. The installation practice shall be in accordance with the last edition of NFPA 72.
- 2.1.3 There shall be sounder and beacon on the roof of the building.
- 2.1.4 Fire protection system, fire alarm system and accessories shall be in accordance with the applicable requirements set forth in the latest edition of the following codes and standards:

- NFPA 70 : National Electrical Code.
- NFPA 72 : National Fire Alarm Code.
- NFPA 75 : Standard for the Fire Protection of Information Technology Equipment.
- NFPA 76 : Standard for the Fire Protection of Telecommunications Facilities.
- IEEE Std 979: IEEE Guide for Substation Fire Protection
- NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations

- 2.2 There shall be one fire alarm system graphic annunciator at each building to enable responding personnel to identify the location of a fire accurately and to indicate the status of emergency equipment or fire safety functions.
- 2.3 Fire protection system circuits for buildings and switchyards : notification appliance circuits , and signaling line circuits , shall be class A circuit. Initiating device circuits can be class B circuit.
- 2.4 Signals of indoor fire protection system of each room and signals of outdoor fire protection system of each transformer / shunt reactor shall be sent to local CCS, GCC, RCC, and NCC as following details;



- 2.5 There shall be only one subcontractor engaging in design, supply and installation of Fire Protection System for Buildings and Switchyard.
- 2.6 Water supply system.
- 2.7 All building wall openings for fire protection dampers shall be provided with stainless steel louvers and insect screens to install inside of building.
- 2.8 For portable fire extinguisher as shown on specification 3001- 10.13.3 shall be changed to the new details as followings :

- The fire extinguishers shall be conformed to latest TIS standards. The portable and mobile fire extinguishers shall be carbon dioxide (CO₂) conforming to TIS 881 and/or dry chemical conforming to TIS 332 , capacity 10 lbs/set. The fitting accessories shall be provided.
 - The portable fire extinguishers shall be installed according to the latest NFPA 10.
- 2.9 There shall be safety signs for fire extinguisher, manual release station and fire alarm device.
- 2.10 Fire protection system shall be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation.
- 2.11 Consumable materials for fire protection system, for example, filters, liquids, and seals shall be provided according to manufacturer's instructions for a period of two years.
- 2.12 For all buildings, piping or cable penetrating the wall/floor and block out at wall/floor shall be enclosed with fire stop material. Fire stop material shall be approved by UL Listed/FM Approved and comply with NFPA 80 (Standard for Fire Doors and Other Opening Protectives) and other relevant standards. The installer shall be certified by manufacturer and have experience in installation of material for at least 5 years, of at least 10 projects.
- 2.13 Fire detection devices in substation shall be as table below.

Protected Area	Detector
1. Control, Relay and Telecommunication Rooms	ASD and SD
2. Under-Raised Floor	ASD and SD
3. Feeder Sections and Switchgear areas	ASD and SD
4. Electrical Room	ASD and SD
5. Battery room	
5.1 Battery room Vented Type	HD
5.2 Battery room Dry Type	HD
6. GIS Area	OBSD
7. Inert Gas Room	SD
8. Other Room such as Shops, Office, Warehouse and Pantry	HD or SD
9. Emergency Diesel generator room or Emergency Generator Set House	HD
10. Transformer, Shunt Reactor	LHD
11. Cable Spreading Rooms and Cable Tunnels	<ul style="list-style-type: none"> ▪ SD when environmental condition is acceptable. ▪ LHD when environmental condition is out of range for SD ▪ ASD in high risk area and required early response.
12. Main Cable Trench of GIS Area	LHD

Abbreviations

1. Heat detector, HD
2. Addressable Spot-Type Photoelectric Smoke detector, SD
3. Linear Heat Detector, LHD
4. Aspirated smoke detectors, ASD
5. Optical beam smoke detector, OBSD

2.14 Pipe coating system shall conform to ASME A13.1 standard and ANSI-A13.1

2.15 Underground water piping shall have indicator sign.

2.16 For Fire protection system design shall be conformed to NFPA 101 (Life Safety Code).

CIVIL WORK

3. Design and construction of

3.1 Steel structure and foundations for Specified equipment and the others not shown in "For Construction drawings" and / or EGAT's specification.

3.1.1 115 kV GIB & GIS bushing structure and foundation.

3.2 Road and drainage system.

3.3 Drainage system for cable trench.

3.4 Remote control (shall be controlled from either the control room or the guard house) and door phone system for switchyard entrance gate and main entrance gate.

3.5 Three minutes 3D animation presentation file (MP4, resolution not less than 1440 p; 2500 x 1440) demonstrating details of switchyard and interior and exterior buildings shall be arranged.

4. Construction of

4.1 Steel structure foundation.

4.2 Take-off foundation.

4.3 Equipment structure foundation with sub trench (if required).

4.4 115 kV RC slab for skid base foundation

4.5 Concrete pole strain bus structure

4.6 Cable trench.

4.7 RC. Road.

4.8 Crushed rock surfacing.

4.9 Wire mesh fence.

4.10 Concrete fence.

- 4.11 Main entrance gate 8.00 m width (sliding).
 - 4.12 Signboard structure and foundation.
 - 4.13 Site office.
 - 4.14 Guard house.
 - 4.15 Hand hole
 - 4.16 Flag pole.
 - 4.17 Lamp post for fence and access road lighting LED type foundation.
 - 4.18 Switchyard entrance gate (sliding gate)
5. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.
 6. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.
 7. All design, construction and testing shall be in accordance with Specification No.3001 : Civil and Architectural Work.

Floor Loading for building.

Minimum floor loading of substation shall be as follow:

a. GIS room and Switchgear room	2,000	kg/sqm
b. Control and communication room	1,250	kg/sqm
c. Removable raised floor	1,700	kg/sqm
d. Station battery room	1,600	kg/sqm
e. Cable laying floor	600	kg/sqm
f. Conference room	500	kg/sqm
g. Living, Office, Toilet etc.	300	kg/sqm
h. Platform area for GIS	2,000	kg/sqm
i. Platform area for Control and Communication	1,700	kg/sqm
j. Inert gas storage area	1,200	kg/sqm
k. Roof deck	200	kg/sqm
l. Storage area for warehouse	800	kg/sqm
m. Electrical room	1,700	kg/sqm

8. Bored hole for soil investigation shall conform to Specification No. 3001. The position shall be submitted to EGAT for approval.
9. EGAT's Soil Investigation Report (attached to the Contract) is a document that can be a reference for bidding, however; the review of the soil investigation report shall be under responsibility of the Contractor and the warranty of work shall remain following all obligations as specified in the Contract.
10. In case of soil layer is soft clay, consolidation test shall be performed from clay of one bored hole only. The position shall be submitted to EGAT for approval.
11. All foundations shall be as specified in layout drawing. Except the result of soil investigation shows that the specified foundations are not appropriate, the Contractor shall design the proposed foundations.
12. The Contractor shall perform a static load test for 115 kV GIS Building foundations in accordance with ASTM D1143 (if pile type foundation is required).
13. Dynamic load test (DLT) according to ASTM D4945-89 shall be applied to at least 2% of driven piles (if driven pile type is required) except for driven pile of fence and lamp post.
14. Seismic load test (sonic integrity test) according to ASTM D5882-96 shall be applied to all bored piles (if bored pile type is required).
15. Plate bearing test according to ASTM D1194-94 shall be submitted to EGAT for approval (if pad type foundation is required).
16. The Contractor shall remove all debris from construction material and other works in order to make the site clean and be in the condition acceptable to EGAT.
17. According to the Contract Document Section G-3 : Contractor's Office and Other Construction Facilities; the detail in paragraph 3 shall be changed as follows : the Contractor shall provide for EGAT an office container at the site during construction with a minimum space of 36 sq.m for office area, 24 sq.m for conference room which shall both be air-conditioned and 4 sq.m for toilet. The facilities as shown on the section G-3 are required for 2 sets.

2. 115 KV BAN BUENG SUBSTATION

GENERAL

The existing 115 kV Ban Bueng substation is located in Tambon Ban Bueng, Amphur Ban Bueng, Chonburi Province. The existing 115 kV Ban Bueng substation is an outdoor conventional type, with main and transfer bus scheme. It shall be upgraded to digital substation and replaced the existing equipment.

The contractor shall supply equipment, perform construction and installation work necessary for completion of operation substation in accordance with the contract documents. The design work shall include, but not limited to, technical calculation, preparation of drawings, bill of materials for installation and construction work. For accomplishment of complete operational substation, Scope of contractor's work shall include connection to all public utilities i.e.electrical power, water and drainage. Testing and commissioning of all equipment required to make the substation function properly.

Besides, all detailed engineering design work, calculations, drawing preparation, submission of backup data, test reports instruction books (and) ,etc.shall be included.

- 1) As stated elsewhere in these bidding documents, the drawings included in the bidding documents except drawing mark "For Construction" are for bidding purposes only and shall not be used for execution of the work.
- 2) The submitted drawings which are incomplete/unacceptable, or are the bidding document copies with minor modifications shall be returned unmarked to the contractor.
- 3) The drawings shall be furnished which provide all details required for thoroughly described equipment as well as installation methods and requirements. However, EGAT retains the right to request additional details if those furnished are perceived inadequate.
- 4) Calculations, backup data and documentation are required for all parts of the design. The furnished data shall verify completely that design is adequate for application purpose.

ELECTRICAL PART

Work included in this Contract.

The work included in this contract to be performed by the contractor shall be as specified in the contract documents and as follows:

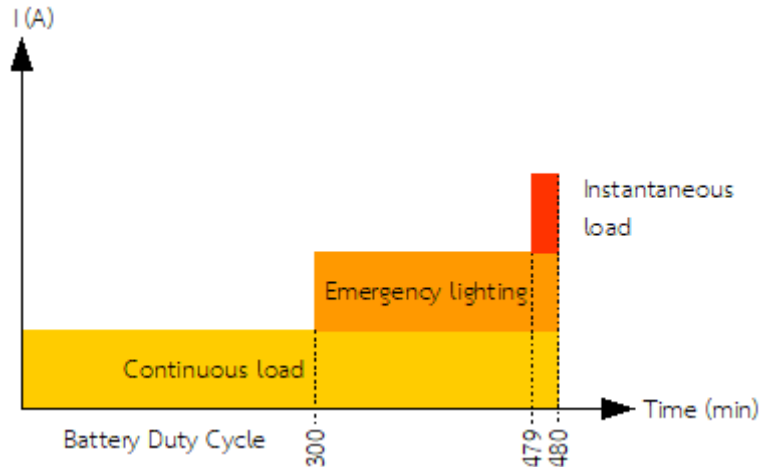
1. Conventional Substation

- 1.1 Design, supply and replacement of equipment and structures. The detail of replacement are shown on the bidding document drawing.
- 1.2 Design, supply and replacement of the identification plates as follows:
 - Bay 1-1A : identification plates for 115 kV Line No.2 to Ban Bueng 2 (existing 115 kV Line No.2 to Bo Win)
 - Bay 1A-2A: identification plates for 115 kV Line No.1 to Ban Bueng 2 (existing 115 kV Line No.1 to Bo Win)
- 1.3 Design, Design, supply and installation of equipment required for a completely new control building.
- 1.4 Design, supply and installation of equipment required for a complete upgrade to digital substation.

2. Station service system

- 2.1 Design, supply and installation of station service system complete with integral accessories to provide a complete system operation. The station service system mainly consists of as follows:
 - 250 kVA, 22,000-400/230V distribution transformer (KW1A)
 - 250 kVA, 22,000-400/230V distribution transformer (KW2A)
 - Automatic transfer switch (ATS)
 - 22 kV drop-out fuses
 - 600 V, 400A safety switches
 - 22 kV equipment, and AC&DC distribution boards, stationary batteries, battery chargers, power cables and all related equipment for the complete operation.
- 2.2 Design, supply and installation of equipment required for a complete 400/230 V power supply system.
- 2.3 Design, supply and installation of the stationary battery, in which the battery is capable of delivering power to the control and protection for tripping all circuit breakers, essential load for merging unit and emergency essential load for at least 8 hours if normal station service fails. The capacity of the battery shall not be less than 500 Ah. In case of bus faults occurring on the last hour of battery power, the battery shall generate sufficient power for tripping all circuit breakers as shown in figure below. The stationary battery shall be designed and calculated in accordance with IEEE or other acceptable international standards. In addition, the size of the stationary battery shall be designed to support the operation of existing

and future bay as shown on the attached bidding document drawings. The calculation shall be submitted to EGAT for approval.



- 2.4 Emergency lighting system shall be installed at the control building in case of normal station service fails. The said emergency lighting system is activated and capable of generating illumination level of at least 150 LUX for at least 3 hours.

3. Grounding system

- 3.1 Design, supply and installation the grounding system of the following:
- 115 kV substation
 - 22 kV system
 - Control building
- 3.2 The grounding conductor of the substation grounding system shall be of 4/0 AWG bare copper wire type.
- 3.3 The contractor shall design, supply and install the conductor size 2x4/0 AWG bare copper wire type connect from ground grid to steel structure and equipment.
- 3.4 Design, supply and installation of the grounding system of the isolating transformer. The grounding system of the isolating transformer shall be separated from the substation. The calculation shall be submitted to EGAT for approval.
- 3.5 The contractor shall conduct the soil resistivity measurement. The result shall be submitted to EGAT for approval.
- 3.6 The contractor shall design a grounding grid for the extended area based on the measured soil resistivity by hand calculation using the equations in IEEE-80 standard and submitted to EGAT for approval. The parameters for grounding system calculation shall be used as follows;
- Fault current division factor (S_f) value = 1
 - Fault current (rms) = 31.5 kA
 - Time duration of fault = 1 second
 - The grounding conductor spacing for the grounding grid shall be 10.00m (D_0)
 - The total number of ground rods shall be 20 pieces

These parameters shall be used for determine the size of grounding conductor for the substation grounding system. If the ground conductor spacing calculated by hand (D_1) is less than the grounding conductor spacing for reference (D_0), the contractor shall design a grounding grid by using the software. The certification of software shall be acceptable for commercial use.

- 3.7 The ground grid conductor spacing under the building area shall be the same as the switchyard.
- 3.8 The grounding system for the extended area shall connect to the existing ground grid.
- 3.9 Modification of the existing grounding system (if any).

4. Lightning protection system

- 4.1 For the design of lightning protection system for the control building, the lightning protection level (LPL) shall be used level 1 for calculation and the overhead ground wire is not permitted. Air terminal rods installed at the roof shall be used instead.
- 4.2 Lightning protection system shall be designed to meet IEC, NEMA and E.I.T. standards or internationally-accepted standards.

5. Facility system

5.1 Outdoor facility system

- 5.1.1 Design, supply and installation of a substation lighting system complete with all integral accessories to provide a complete system operation. The lighting system shall mainly consist of equipment lighting, fence lighting, access road lighting, lighting relay panels (LRP), raceways and wiring cables for lighting circuits.
- 5.1.2 The lamps for outdoor facility lighting system shall be LED type with all integral accessories, e.g.lamp holders, fixtures, reflectors, and etc.The contractor shall provide drawings that show details for installation.
- 5.1.3 Design, supply and installation of circuits for remote controlof the switchyard gate. The control of the switchyard gate shall be operated in both manual and remote-control modes which shall be controlled from both the control room and the guardhouse.

5.2 Indoor facility system

- 5.2.1 Design, supply and installation of the facility system which mainly consists of power supply, lighting system, lightning protection system, grounding system, power supply, fire alarm and protection system, air conditioning system, ventilation system and telephone & LAN system in the control building. All cable wiring systems shall conform NEC and IEC standards or accepted international standards.
- 5.2.2 The lamps for indoor facility lighting system shall be LED type with all integral accessories, e.g.lamp holders, fixtures, reflectors, and etc. The contractor shall provide drawings that show details for installation and specify the LED lamp and LED luminaire circuit identified that the LED lamp circuit shall be supplied by 2 - 3 manufacturers.
- 5.2.3 All steel accessories e.g.lip-channel, conduit, conduit fittings, conduit accessories, box and cover shall be hot dip galvanized.

- 5.3 The size of low voltage cable shall be sufficient to keep the voltage drop at the load point less than 5% at rated current.
- 5.4 The voltage drop shall conform to EGAT's requirement and the calculation shall be submitted for approval.
- 5.5 The inverter for essential load of merging unit and emergency essential load shall meet the requirement as the table below. The contractor shall responsible for inverter sizing calculation and the calculation shall be submitted to EGAT for approval.

No.	Description	Requirement data	Unit	No.	Description	Requirement data	Unit
1	Environmental Condition			6	Control button		
	1.1 Minimum ambient temperature	0	Celsius		6.1 Inverter START and STOP	YES	
	1.2 Maximum ambient temperature	40	Celsius		6.2 Acknowledge alarm silent	YES	
	1.3 Relative Humidity	0-95	%		6.3 Lamp test	YES	
	1.4 Tropicalization	YES	-				
	1.5 Altitude	<1000	meters	7	Measurement scale 90 degree		
					7.1 AC output voltage cls 1.5	YES	
2	Cabinet			8	Protection		
	2.1 Protection Level	IP 20			8.1 Overload shutdown	YES	
	2.2 Mounting	Removable			8.2 Low DC voltage shutdown (<105 V)	YES	
	2.3 Epoxy painting color	RAL7032			8.3 AC output fuse to prevent short circuit	YES	
	2.4 Convection ventilation	Forced air			8.4 Overload temperature shut down	YES	
	2.5 Steel sheet thickness	1.5	mm.		8.5 Thermistor fan controlled	YES	
					(Inverter will shut down when temperature		
3	Main supply Voltage				8.6 DC circuit breaker	YES	
	3.1 Nominal Voltage	125	V.		8.7 AC circuit breaker	YES	
	3.2 Voltage variation	100-150	V.		8.8 DC input fuse to prevent short circuit current	YES	
	3.3 Permissible ripple voltage on DC	< 5	% Vp-p				
	3.4 Self-precharge	YES		9	Monitor		
4	Output AC Voltage				9.1 Input DC voltmeter	YES	
	4.1 Nominal voltage	220	V.		9.2 Output AC voltmeter	YES	
	4.2 Supply system	1 ph+N					
	4.3 Static voltage regulation at 0-100% load variation and power factor 1.0	+/- 2	%	10	Alarm and LED lamp status Indicator		
	4.4 Dynamic voltage regulation	+/- 5	%		10.1 Inverter ON/OFF	YES	
	-At AC input fluctuation +/- 10 %				10.2 DC input status	YES	
	4.5 harmonic distortion	< 5	% THD		10.3 Load on inverter	YES	
	4.6 Output frequency	50	Hz		10.4 LED lamp alarm indicators (Alarm noise	YES	
	4.7 Frequency variable	+/- 0.5	%		10.5 AC output status	YES	
	4.8 Synchronized frequency	+/- 1	% Hz		(LED shall blink when Under/Over voltage +/- 10		
5	Output capacity			11	Cable entry		
	5.1 Output continuous capacity	xx	kVA		11.1 DC incoming	YES	
	Note xx : Design by Contractor				11.2 AC Outgoing	YES	
	5.2 Overload capacity 100 % continuous	YES			11.3 Terminal	INSIDE	
	5.3 Overload capacity 125 %	10	min				
	5.4 Overload capacity 150 %	1	min				
	5.5 Efficiency at rated load and 1.0 power factor	> 85	%				

6. Telecommunication system

- 6.1 Design, supply and installation of the telecommunication tower. The telecommunication tower shall be installed on the roof of the Control building. The said tower shall be constructed and divided into appropriate portions which are painted white and orange alternately with the top and bottom portions being painted orange. The obstruction lighting system shall be controlled by automatic flash box (AFB) that gives 30-60 flashes per minute. The AFB shall be

turned on and turned off by a photo-light switch. The lightning protection for the telecommunication tower shall be calculated and designed by the contractor and the said calculation shall be submitted to EGAT for approval.

7. Other work

- 7.1 Testing and commissioning of all equipment required to make the substation function properly.
- 7.2 Modification of Automatic transfer switch board (ATS) for the installation of Kilowatt-hour meters.
- 7.3 Modification of chain link lamp posts for the replacement of fence lighting.
- 7.4 Modification of 22 kV Metering structure for the installation of a complete 22 kV system, 22 kV drop-out fuse and distribution transformers. (if any)
- 7.5 Installation of heat shrinkable insulation material for 22 kV aluminum conductor between 22 kV drop-out fuses and distribution transformers.
- 7.6 Removal of equipment and support structures in existing 115 kV conventional substation. Details of removal are shown on the bidding document drawing.

All removed equipment shall be carefully packed by the contractor and delivered to EGAT at Ao Phai Substation. Ao Phai Substation is located at Amphoe Sri Racha, Chon Buri Province.

Distance about 45 km from Ban Bueng Substation.

CONTROL AND PROTECTION PART

Work included in this Contract

1. Design, supply, installation, wiring, test and commissioning of complete control and protection system based on the IEC 61850 standard which comprises at least the following equipment:

For Process Level

- Merging Unit Cabinet
- 400/230 VAC, 125VDC power panel and distribution boards

For Bay Level

- Protective IED panel (swing-rack type)
- Bay Control Unit (BCU) panel (swing-rack type)
- Metering panel (swing-rack type)
Each energy meter shall be calibrated by EGAT's Energy Meter Department before being installed in each metering panel.
- Ethernet switch panel for station bus (19" rack type)
- Ethernet switch panel for process bus (19" rack type)
- E1 converter panel (19" rack type)
- EGAT-PEA interfacing panel (19" rack type)
- Fault Recording System (FRS) panel (19" rack type)
- 400/230 VAC, 125 VDC power panel and 125 VDC distribution boards

For Station Level

- GPS receiver and gateway panel (19" rack type)
- Outdoor antenna and accessories
- HMI and accessories
- Engineering workstation (EWS) and accessories
- Redundant UPS systems to power HMI and EWS
- Complete set of operator console and chair
- 400/230 VAC, 125 VDC power panel and 125 VDC distribution board

For loose part

- Optical fiber cables, copper cables, patch cord cables and accessories as well as connection of cables among all of the boards and the associated equipment in order to complete the function of the control and protection system.
- EFLEX conduits for optical fiber cables inside/outside buildings
Outdoor optical fiber cables shall be wired in EFLEX conduits laying in cable trench as per drawing no. TP-E-20.13.
- Loose equipment as specified in price schedule.

2. Design, supply, installation, wiring, test and commissioning of complete operator console, engineering workstations, HMIs, gateways, and all required system software and hardware in order to successfully run IEC 61850 based substation protection and automation system together with the existing EGAT's SCADA system which at least consists of National Control Center (NCC), Backup National Control Center (BNCC), Regional Control Center (RCC), Backup Regional Control Center (BRCC), Group Control Center (GCC), and Backup Group Control Center (BGCC). In addition, IEC61870-5-104 is used for EGAT's SCADA system. HMIs and engineering

workstation shall be of the separated industrial desktop computers running on the latest licensed Microsoft Windows operating system with the licensed antivirus program.

3. The System Integrator (SI) shall be responsible for at least the following scope of works:

- Design the complete IEC 61850 based substation protection and automation system as well as the communication network based on IEC 61850 standard in order to coordinate with the existing equipment and/or equipment supplied by EGAT.
- Configure each IED and communication network in order to completely fulfill the designed IEC 61850 based substation protection and automation system.
- Design the engineering workstation, HMIs, gateways and all required system software in order to successfully run the IEC 61850 based substation protection and automation system. In addition, the signal lists to be displayed/ controlled via engineering workstation, HMIs and the remote EGAT's SCADA shall be discussed with EGAT after the Award of Contract.
- Perform at least the following tests:

- o Individual test

This test is to verify each IED performance which shall comply with EGAT's Specifications as well as the relevant drawings and documents. In addition, the internal logic of each IED shall be adapted according to EGAT's comments in case the IED performance does not fulfill EGAT's requirements.

- o Service setting test

This test is to find out the proper setting values for all IEDs. The calculation report using the given data which will be provided after the Award of Contract shall be done by SI and submitted to EGAT for approval before configuring to all IEDs.

- o Factory Acceptance Test (FAT)

This test is to verify system performance with configured IEDs which shall comply with EGAT's Specifications as well as the relevant drawings and documents.

- o Site Acceptance Test (SAT)

This test is to finally verify the complete IEC 61850 based substation protection and automation system with the existing equipment and/or equipment supplied by EGAT at site which the system performance shall comply with EGAT's Specifications as well as the relevant drawings and documents. In addition, the test will be under EGAT's supervision.

All test reports shall at least clearly show the following details:

- o Test procedures
- o All used data such as parameters, standards, and etc.
- o Test results
- o Conclusion

In addition, all tests shall be witnessed by EGAT's staff. Moreover, EGAT shall have access to all necessary data for complete understanding of the tests as well as the validity of the results.

4. The Contractor shall be responsible for providing both hardcopies and electronic files of the complete schematic and wiring diagrams of the IEC 61850 based substation protection and automation system including programmable logic schemes of each IED, programmable logic schemes of parallel transformer (if any), HMI graphic display, SSD files, ICD files, SCD files, CID files, signal lists of SV, GOOSE and MMS, and communication network connection diagram. Moreover, the required software for the above-said SCL files configuration shall also be supplied. In case of the SCD file configuration, the supplied software shall be compatible with all IEDs operated in the substation and shall also support multi-vendor IEDs. In addition, the Contractor can use the substation system network topology on drawing no. TP-E-20.3 as a guideline. The said drawing can be modified by the Contractor. However, it shall be submitted to EGAT for approval.
5. The Contractor shall be responsible for providing both hardcopies and ACAD files of the complete schematic and wiring diagrams of the interfacing work between IEC 61850 based substation protection and automation system and the existing equipment and/or equipment supplied by EGAT. In addition, the approved final revision of green-red drawings and final drawings shall be printed and submitted in A1 paper size.
6. The Contractor shall provide the draftsman working at the site during the commissioning stage in order to be in charge of writing the as-built drawings of control and protection system.
7. Removal of the unused existing cables. The removed cables which shall be neatly reels and shall be kept in a suitable place recommended by EGAT.

CIVIL AND ARCHITECTURAL PART

Work included in this Contract.

ARCHITECTURAL WORK

1. Design and construction of

1.1 115 kV GIS Building

- 1.1.1 Structure & foundation. The proper structure can be selected for the design and construction and shall be submitted to EGAT for approval.
- 1.1.2 RC and/or steel structure for roof.
- 1.1.3 Fire protection for steel structure shall conform to legal provision, EGAT's specifications and Design manual for substation. Therefore, Fire protection for steel structure specification in Architecture drawing shall be cancelled.
- 1.1.4 Architecture of the whole building.
- 1.1.5 The contractor shall construct the building in accordance with "IEEE STD- 979-1994 (R2004)" (IEEE Guide for Substation Fire Protection).
- 1.1.6 Telecommunication tower structure (self-support) 6.00 m. installed on the roof deck of Control building
- 1.1.7 115 kV Control Building shall be designed with reference to Surin 1 Substation (Dwg.No.SU1-CD-7-03A 01/12-12/12) Equipment layouts and cable block out shall conform to electrical drawing (Dwg.No.BBG-S-6 02/02). Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.
- 1.1.8 Battery room shall be expanded for more area that conforms to battery equipment drawing (Dwg.No.BBG-S-6 02/02). The battery room's expansion shall not affect to the area of the nearby room.
- 1.1.9 The control room shall divided for electrical room's area, and the area shall not be less than 8.50x4.00 m. The size and location of divided area shall conform to electrical drawing (Dwg.No.BBG-S-6 02/02). The wall partition shall be painted fiber-cement board, joint plastered
 - Material: Fiber cement board, thickness as indicated on Drawings. Seal all cutting edges with approved water repellent or non-staining silicone type.
 - Thickness: Not less than 10 mm.thk.
 - Finishing: Color specified later
 - Fire resistance: Passed BS476 part 6 and 7 classified as class "0" material.
- 1.1.10 The design of building shall analyze and take the following aspects into consideration: Site, Environment, Context, Function, Climate (sunlight, wind, rain, heat etc.), Energy efficiency, Safety and including aesthetic of architecture to encourage EGAT corporate identity.

1.1.11 For exterior surface of the building, there shall be at least 20% of total building area which uses yellow color that represents corporate image of EGAT.

1.1.12 Building facilities

- Electricity and illumination system including cable work for illumination, ventilation system, power supply, air conditioning system, and telephone system.
- Plumbing system for water supply, building drain and vent, storm water drainage including sanitary wares and fittings.
- Miscellaneous including grounding and labeling.
- Cable routing and cable support (cable tray and cable ladder) installed in cable room and main cable trench.
- Access floor system or Raised flooring system (For walking area)
 - Panels shall be capable of supporting concentrated load not less than 500 kg. A uniform load or distributed load not less than 1,500 kg/sq.m.
 - Floor panels shall consist of calcium-sulphate have protection against humidity, rotting and fire panels shall be jig-milled to thickness size.
 - *Thickness: not less than 35 mm.
 - *Module : 600x600 mm. or 24x24 Inches
 - Finish the surface of the floor panels with floor covering material indicated mineral panels with High Pressure Laminated (HPL) shall be not less than 1.5 mm. from manufacturer standard.
 - Panels' material shall be non-combustible, fire retardant, or the fire resistant building material class A, with galvanized steel plate covering both on the top and bottom of the panel.
 - The understructure system of access floor such as pedestal profile, Stringer, head plate and steel bolt shall be made of Electroplated Galvanized Steel.
 - The system frame areas which are fixed to the current system by bolting and adhesive shall be unwelded connection.
 - The access floor system, following standard :
 - *Load test: EN 12825 or CISCA
 - *Fire test: DIN4102: F30 A or ASTM E84 Class A or BS476 part 4 Class A
 - The test report shall be certified by a third party accredited laboratory.
 - The pattern of access floor (Walking area) relating to cable route and equipment layout shall be submitted to EGAT for approval.

- All components of access floor system, which consist of floor panel, stringer, pedestal, and other part, shall be manufactured by the same manufacturer.
- With 10 years guarantee of material and 2 years installation.
- The access floor system material in the Specification No.3001 (Civil and Architectural work) No.3001-10.8.3.5 Access Floor System (Raised Flooring System) and the referenced drawings of the said material shall be cancelled.
- Signboard on building and room name sign on each room.
- Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).
- Furniture as specified in architectural Drawings except as following :
 - One 42 inch LED TV : Resolution not less than 1920 x 1080
 - One refrigerator : 9 or 10 cu.ft
 - One water filter : Reverse osmosis system or beam system
 - One microwave oven: Oven capacity not less than 23 liter, microwave power not less than 800 watt.

WATER SUPPLY AND FIRE PROTECTION SYSTEM

2. Design and construction of

2.1 Fire protection system for 115 kV GIS Control Building.

2.1.1 Control Building shall consist of Total Flood Clean Agent Fire Suppression System with heat detector, addressable type smoke detector and aspirated smoke detector.

2.1.2 Fire protection system of Control Building shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected device, shown and recorded at control room in 115 kV Control Building. The installation practice shall be in accordance with the last edition of NFPA 72.

2.1.3 There shall be sounder and beacon on the roof of the building.

2.1.4 For system requirements for indoor fire protection system as shown on specification 3001-10.13.1 part e, item no.1 and 6 shall be changed to the new details as follow

- (1) System description and operation : Supply and Installation of a Total Flood Clean Agent Fire Suppression System utilizing IG-100 shall cover all these zones :

Zone 1: Equipment (Control/Relay) Room ;

Zone 2: Electrical Room;

Zone 3: Under Raised Floor (If Required);

Zone 4: Battery Room;

Zone 5: Cable Room (If required) ;

Zone 6: Inert Gas Room

Other zone (If required)

Each protected zone shall have its own set of IG-100 cylinders.

- (6) Detectors shall be cross-zoned detection requiring 2 detectors to be in alarm before discharge. A zone of A or B of addressable smoke detector and a zone C of all ASD shall be crossed.

2.1.5 For air sampling smoke detector as shown on specification 3001- 10.13.2 part i item no.1, 7, 13 and 14 shall be changed to the new details as followings :

i. Air Sampling Smoke Detector.

- (1) Shall consist of a high sensitivity type detector, using light scatter technology.
- (7) Detection system for all cabinet shall be omitted.
- (13) The minimum sensitivity settings for a single sampling hole are so that the detection system alarm at 1.5% obs/ft (4.95% obs/m). A sampling hole maximum coverage area is 400.0 sq.ft (37.2 sq.m).
- (14) Maximum transport time from the most remote port to the detection unit of an air-sampling system shall be a maximum of 90 seconds.

2.1.6 Fire protection system, fire alarm system, installation room and accessories shall be in accordance with the applicable requirements set forth in the latest edition of the following codes and standards:

- NFPA 2001: Clean Agent Fire Extinguishing Systems.
- NFPA 70 : National Electrical Code.
- NFPA 72 : National Fire Alarm Code.
- NFPA 75 : Standard for the Fire Protection of Information Technology Equipment.
- NFPA 76 : Standard for the Fire Protection of Telecommunications Facilities.
- IEEE Std 979: IEEE Guide for Substation Fire Protection
- NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations.

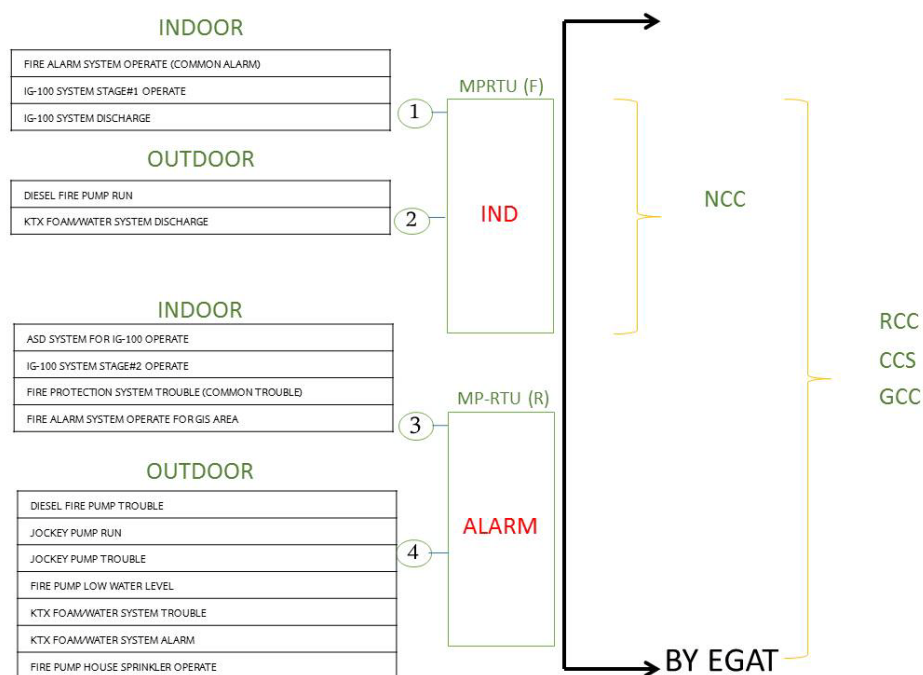
2.1.7 There shall be one control panel for which controls fire detection system and IG-100 fire suppression system in the building.

2.1.8 There shall be a protective clear polycarbonate cover which can be immediately lifted or opened for all IG-100 manual release stations.

2.1.9 Battery room shall be furnished with an all-stainless steel, wall-mounted emergency eyewash. Contractor shall submit the catalog and proposed location of the eyewash to EGAT for approval.

2.2 Fire protection system for the switchyard to meet the requirement as specified in IEEE Guide for Substation Fire Protection: IEEE Std 979, all requirements of NFPA 850.

- 2.3 Signals of indoor fire protection system of each room and signals of outdoor fire protection system of each transformer / shunt reactor shall be sent to local CCS, GCC, RCC, and NCC as following details;



- 2.4 There shall be only one subcontractor engaging in design, supply and installation of Fire Protection System for Buildings and Switchyard.
- 2.5 Water supply system.
- 2.6 All building wall openings for fire protection dampers shall be provided with stainless steel louvers and insect screens to install inside of building.
- 2.7 For portable fire extinguisher as shown on specification 3001- 10.13.3 shall be changed to the new details as followings :
- The fire extinguishers shall be conformed to latest TIS standards. The portable and mobile fire extinguishers shall be carbon dioxide (CO₂) conforming to TIS 881 and/or dry chemical conforming to TIS 332 , capacity 10 lbs/set. The fitting accessories shall be provided.
 - The portable fire extinguishers shall be installed according to the latest NFPA 10.
- 2.8 There shall be safety signs for fire extinguisher, manual release station and fire alarm device.
- 2.9 Fire protection system work shall be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers’ recommendation.
- 2.10 There shall be a set of computer desk with chair, a set of CPU which suitable for fire protection system software and operate 24 hours a day and a set of 24” LED monitor which show the status of fire protection system in control room in 115 kV Control Building. One set of laser jet printer shall be provided.

- 2.11 Consumable materials for fire protection system, for example, filters, liquids, and seals shall be provided according to manufacturer's instructions for a period of two years.
- 2.12 For all buildings, piping or cable penetrating the wall/floor and block out at wall/floor shall be enclosed with fire stop material. Fire stop material shall be approved by UL Listed/FM Approved and comply with NFPA 80 (Standard for Fire Doors and Other Opening Protectives) and other relevant standards. The installer shall be certified by manufacturer and have experience in installation of material for at least 5 years, of at least 10 projects.
- 2.13 Fire detection devices in substation shall be as table below.

Protected Area	Detector
1. Control, Relay and Telecommunication Rooms	ASD and SD
2. Under-Raised Floor	ASD and SD
3. Feeder Sections and Switchgear areas	ASD and SD
4. Electrical Room	ASD and SD
5. Battery room	
5.1 Battery room Vented Type	HD
5.2 Battery room Dry Type	HD
6. GIS Area	OBSD
7. Inert Gas Room	SD
8. Other Room such as Shops, Office, Warehouse and Pantry	HD or SD
9. Emergency Diesel generator room or Emergency Generator Set House	HD
10. Transformer, Shunt Reactor	LHD
11. Cable Spreading Rooms and Cable Tunnels	<ul style="list-style-type: none"> ▪ SD when environmental condition is acceptable. ▪ LHD when environmental condition is out of range for SD ▪ ASD in high risk area and required early response.
12. Main Cable Trench of GIS Area	LHD

Abbreviations

1. Heat detector, HD
 2. Addressable Spot-Type Photoelectric Smoke detector, SD
 3. Linear Heat Detector, LHD
 4. Aspirated smoke detectors, ASD
 5. Optical beam smoke detector, OBSD
- 2.14 Pipe coating system shall conform to ASME A13.1 standard and ANSI-A13.1
- 2.15 Underground water piping shall have indicator sign.
- 2.16 For Fire protection system design shall be conformed to NFPA 101 (Life Safety Code).

3. Construction of
 - 3.1 Cabinets with 2x50 lbs wheel fire extinguisher.

CIVIL WORK

4. Design and construction of
 - 4.1 Road and drainage system.
 - 4.2 Drainage system for cable trench.
 - 4.3 Cable ladder 0.60 m width type CLE (for transformer)
 - 4.4 Remote control (shall be controlled from either the control room or the guard house) and door phone system for main entrance gate and switchyard entrance gate.
 - 4.5 Three minutes 3D animation presentation file (MP4, resolution not less than 1440 p; 2500 x 1440) demonstrating details of switchyard and interior and exterior buildings shall be arranged.
 - 4.6 Oil containing pit with steel grating and black steel spiral-seam pipes (TIS 427-2531) with protection method according to AWWA C217, C205.

5. Construction of
 - 5.1 Steel structure foundation.
 - 5.2 Equipment structure foundation with sub trench (if required).
 - 5.3 Cable trench.
 - 5.4 RC. Road.
 - 5.5 Crushed rock surfacing.
 - 5.6 Wire mesh fence.
 - 5.7 Switchyard entrance gate (sliding).
 - 5.8 Lamp post for fence and access road lighting LED type foundation.
 - 5.9 Oil separator.
 - 5.10 Fire wall.
 - 5.11 Transformer loading.
 - 5.12 Flag pole

6. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.

7. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.

8. All design, construction and testing shall be in accordance with Specification No.3001 : Civil and Architectural Work.

Floor Loading for building.

Minimum floor loading of substation shall be as follow:

a. GIS room and Switchgear room	2,000	kg/sqm
b. Control and communication room	1,250	kg/sqm
c. Removable raised floor	1,700	kg/sqm
d. Station battery room	1,600	kg/sqm
e. Cable laying floor	600	kg/sqm
f. Conference room	500	kg/sqm
g. Living, Office, Toilet etc.	300	kg/sqm
h. Platform area for GIS	2,000	kg/sqm
i. Platform area for Control and Communication	1,700	kg/sqm
j. Inert gas storage area	1,200	kg/sqm
k. Roof deck	200	kg/sqm
l. Storage area for warehouse	800	kg/sqm
m. Electrical room	1,700	kg/sqm

9. Bored hole for soil investigation shall conform to Specification No. 3001. The position shall be submitted to EGAT for approval.
10. In case of soil layer is soft clay, consolidation test shall be performed from clay of one bored hole only. The position shall be submitted to EGAT for approval.
11. All foundations shall be as specified in layout drawing. Except the result of soil investigation shows that the specified foundations are not appropriate, the Contractor shall design the proposed foundations.
12. Dynamic load test (DLT) according to ASTM D4945-89 shall be applied to at least 2% of driven piles (if driven pile type is required) except for driven pile of fence and lamp post.
13. Seismic load test (sonic integrity test) according to ASTM D5882-96 shall be applied to all bored piles (if bored pile type is required).
14. Plate bearing test according to ASTM D1194-94 shall be submitted to EGAT for approval.(if pad type foundation is required).
15. The Contractor shall remove all debris from construction material and other works in order to make the site clean and be in the condition acceptable to EGAT.
16. According to the Contract Document Section G-3 : Contractor's Office and Other Construction Facilities; the detail in paragraph 3 shall be changed as follows : the

Contractor shall provide for EGAT an office container at the site during construction with a minimum space of 36 sq.m for office area, 24 sq.m for conference room which shall both be air-conditioned and 4 sq.m for toilet. The facilities as shown on the section G-3 are required for 2 sets.

3. 230 KV BO WIN SUBSTATION

CONTROL AND PROTECTION PART

Work included in this Contract

1. Supply loose equipment as specified in price schedule.