

**Contract No.**

**Invitation to Bid No. NPUP-L-04**

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**ELECTRICITY GENERATING AUTHORITY OF THAILAND**



**TWO-ENVELOPE  
BIDDING DOCUMENTS**

**FOR**

**SUPPLY AND CONSTRUCTION OF TRANSMISSION LINES  
500 kV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI)  
AND SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO  
TO DEN CHAI SUBSTATION**

**TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN  
PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE  
FROM LAO PDR PROJECTS**

**VOLUME I OF IV : TERMS AND CONDITIONS**

**EGAT'S FUND**

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**BIDDER :** \_\_\_\_\_

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**(2026)**

**INVITATION TO BID NO. NPUP-L-04**  
**SUPPLY AND CONSTRUCTION OF TRANSMISSION LINES**  
**500 KV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI)**  
**AND SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO**  
**TO DEN CHAI SUBSTATION**

**TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE**  
**AND UTTARADIT PROVINCES FOR POWER PURCHASE**  
**FROM LAO PDR PROJECTS**  
**(TWO-ENVELOPE)**  
**EGAT'S FUND**

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**Anti-Corruption Compliance Checklist****(Rev.1)**

Bidders shall provide written minimum standards of the policy and directions for anti-corruption in relation to procurement (“Minimum Standards”) together with supporting evidence pursuant to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017). This checklist shall be submitted with Bids.

Project: (Please specify the project for which you are bidding).....

State Agency: Electricity Generating Authority of Thailand

Bidder Name: (Please specify the bidder's name).....

Please mark ☒ one of the following boxes ☐ that applies to the bidders\* and complete all details in the space provided:☐ 1. Have one of the following certificates:

- ☐ Certificate under ISO 37001 Anti-Bribery Management Systems, or
- ☐ Certificate from the Thai Private Sector Collective Action against Corruption, or
- ☐ Certificate as prescribed by the Anti-Corruption Co-operation Committee: (Please specify the certificate name)

Validity period: .....(Please specify the validity period of the chosen certificate).....

Please attach an evidence of the chosen certificate.

☐ 2. Do not have a certificate as specified in item 1, but have the Minimum Standards with one of the following validity:

- ☐ Perpetual Validity, or
- ☐ Validity period: .....(Please specify the validity period of the Minimum Standards).....

Details of the Minimum Standards and supporting evidence are as follows: (Please mark ☒ in the “Yes” or “No” column):

Item	Yes	No	Reference Evidence (Please specify Article)
1. Bidders have any clearly defined written anti-corruption policies that is regularly updated.			
2. Bidders have any clearly defined written guidelines, methods, or measures for preventing corruption in procurement that is regularly updated, including but not limited to:			
2.1 Code of Conduct			
2.2 Internal unit or personnel explicitly responsible for the prevention of corruption			
2.3 Penalties or regulations against corruption			
2.4 Channels or systems to report any suspicious or queries related to corruption			
2.5 Anti-corruption training plan			
3. Bidders have communicated and publicized the anti-corruption policies and guidelines relation to procurement as stated in items 1 and 2.			
4. Bidders have provided training on anti-corruption to directors, executives, or employees.			
5. The anti-corruption policies and guidelines are reviewed at least every three (3) years.			

We hereby certify that the information provided above and the supporting evidence are true and correct.

Signed .....

(.....)

Name of Bidder

Stamp company seal (if any)

Date.....

**\* Notes:**

1. The certificate or Minimum Standards shall remain valid and effective from the technical proposal opening date until the date of receipt of the final payment under the contract.
2. If the bidders do not have a certificate, the bidders shall fulfill all items stipulated in the above table to meet the Eligibility of Bidders’ criteria for participation in this procurement.
3. In case of Consortium of two (2) or more firms, partnership or companies, this checklist of each member shall be submitted separately.
4. In the case of an unincorporated Joint Venture, each participant shall submit this checklist separately.
5. This checklist is a translation from Thai based on the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017), dated September 25, 2024. In the event of any discrepancy, the Thai version in the notification shall prevail.

**CONFIRMATION FORM**

**(INDIVIDUAL COMPANY / JOINT VENTURE)**

**INVITATION TO BID NO. NPUP-L-04**

**SUPPLY AND CONSTRUCTION OF TRANSMISSION LINES  
500 KV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI)  
AND SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO  
TO DEN CHAI SUBSTATION**

**TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND  
UTTARADIT PROVINCES FOR POWER PURCHASE  
FROM LAO PDR PROJECTS**

By signing in the space provided below, we confirm that:-

- According to “Eligibility of Bidders” and in addition to the Documentary List attached to the bidding documents, we are not a Jointly Interested Bidder with the other bidders as from the date of EGAT’s issuance of the subject Invitation and are not a person who undertakes any actions as an “Obstruction of Fair Price Competition”.
- According to Article B-8 Information to be Submitted with Bid, we confirm
  - ☐ Registration with the Revenue Department as a value added tax registrant in Thailand as per certificate of value added tax registration (จพ.20) attached.
  - ☐ Non-Registration as a value added tax registrant in Thailand, but will register later.
  - ☐ Non-Registration as a value added tax registrant in Thailand and will not register.

Confirmed :

.....

By : .....

Title : .....

Date : .....

**CONFIRMATION FORM**

**(CONSORTIUM)**

**INVITATION TO BID NO. NPUP-L-04**

**SUPPLY AND CONSTRUCTION OF TRANSMISSION LINES  
500 KV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI)  
AND SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO  
TO DEN CHAI SUBSTATION**

**TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND  
UTTARADIT PROVINCES FOR POWER PURCHASE  
FROM LAO PDR PROJECTS**

**Member No. ... of the consortium:**

By signing in the space provided below, we confirm that:-

- According to “Eligibility of Bidders” and in addition to the Documentary List attached to the bidding documents, we are not a Jointly Interested Bidder with the other bidders as from the date of EGAT’s issuance of the subject Invitation and are not a person who undertakes any actions as an “Obstruction of Fair Price Competition”.
- According to Article B-8 Information to be Submitted with Bid, we confirm
  - ☐ Registration with the Revenue Department as a value added tax registrant in Thailand as per certificate of value added tax registration (ภพ.20) attached.
  - ☐ Non-Registration as a value added tax registrant in Thailand, but will register later.
  - ☐ Non-Registration as a value added tax registrant in Thailand and will not register.

Confirmed :

.....

By : .....

Title : .....

Date : .....

**DISCOUNT FORM**  
***(Excluding VAT)***

**INVITATION TO BID NO. NPUP-L-04**

**SUPPLY AND CONSTRUCTION OF TRANSMISSION LINES  
500 KV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI)  
AND SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO  
TO DEN CHAI SUBSTATION**

**TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND  
UTTARADIT PROVINCES FOR POWER PURCHASE  
FROM LAO PDR PROJECTS**

**Bidder :** \_\_\_\_\_

By signing in the space provided below, we confirm that:-

- ☐ we offer no discount.
- ☐ we offer discount(s) as follows:

Details of discount	Currency	Amount

Remarks :

- ***The Bidder shall apply discount(s) on any item(s), schedule(s), or the total price, excluding Value Added Tax (VAT).***
- The above discount(s) shall not be subject to any conditions. Discount with conditions shall not be considered.
- This Discount Form, together with Bidder's Summary of Bid Price, will be publicly presented on a screen to all Bidders in the bid opening room at the time of bid opening.

Confirmed by authorized person(s):

.....

By : .....

Title : .....

Date : .....

### **Additional Regulation**

This Regulation shall apply to the Enquiry, Bid for Supply, Lease, Hire of Work, or Hire of Consultant by Way of Selection.

#### **1. Attachments**

##### **1.1 Definitions**

###### **1.1.1 Jointly Interested Bidder**

###### **1.1.2 Obstruction of Fair Price Competition**

##### **1.2 Documentary List**

#### **2. Bidder's Qualifications**

2.1 The Bidder shall professionally be in the business of providing materials or services or leasing or consultancy services, as the case may be, 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 the list of work abandoners declared by EGAT according to Article 5 of this Regulation.

2.2 The Bidder shall not be a Jointly Interested Bidder with other bidders as from the date of EGAT's issuance of the Invitation for Bid/Enquiry or the Invitation Letter/ Terms of Reference for the consultancy services, as the case may be, or shall not be a person who undertakes any action as an "Obstruction of Fair Price Competition" described in Article 1.1 – Definitions.

2.3 The Bidder shall not have EGAT's personnel involve 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.

#### **3. Information to be Submitted with Bid**

The Bidder shall submit with his bid the documents according to Article 1.2 - Documentary List, including but not limited to, the following documents :-

##### **3.1 Where the Bidder is a juristic person :**

###### **(a) ordinary partnership or limited partnership**

a certified copy of affidavit of incorporation, name list of managing partners, list of persons entrusted with controlling power (if any), as well as a certified copy of registration for value added tax (if any).

###### **(b) limited company or public limited company**

a certified copy of affidavit of incorporation, memorandum of association, name list of managing directors, list of persons entrusted with controlling power (if any) and name list of major shareholders, as well as a certified copy of registration for value added tax (if any).

Such certified copy of affidavit of incorporation with the validity of not more than six (6) months from the date of certification to the opening date of Bid/Enquiry or the date of Invitation Letter/Terms of Reference in case of consultancy services, as the case may be, shall certify at least the following information :

- (i) Type of a juristic person : an ordinary partnership, a limited partnership, a limited company, a public limited company,
- (ii) Name according to (i),
- (iii) Number and names of managing partners or managing directors,
- (iv) Number and names of managing partners or managing directors authorized to act on behalf of the company,
- (v) Amount of shareholders' equity or registered capital,
- (vi) Authority of managing partner in case of partnership,
- (vii) Location of head office,
- (viii) Registration purposes,
- (ix) Scope of work indicated in business permit license of a foreign juristic person who registers in Thailand,
- (x) Other documents e.g. changes or additions to the above documents, branches (if any).

3.2 Where the Bidder is a natural person or a group of persons other than a juristic person :

a certified copy of :

- identity card ***or passport (if non-Thai national)***
- partnership agreement or contract (if any)
- partners' identity cards ***or passport (if non-Thai national)***
- registration required by Ministry of Commerce of Thailand
- registration for value added tax (if any)

3.3 Where the Bidder is a joint venture / consortium :

a certified copy of :

- association agreement
- identity card or passport (if non Thai national)  
(The participant in the joint venture or consortium is not a juristic person.)
- all documents specified in *Item 3.1* of Additional Regulation  
(The participant in the joint venture or consortium is a juristic person.)

3.4 Other documentary evidence as required per *Item 3, 6 or 8* of Documentary List (if any).

4. Preliminary Examination

4.1 EGAT shall examine the qualification of all bidders to determine whether any bidder is a Jointly Interested Bidder as from the date of EGAT's issuance of the Invitation for Bid/Enquiry or the Invitation Letter/Terms of Reference for the consultancy services, as the case may be, and/or undertakes any action as an "Obstruction of Fair Price Competition" before or during the bid opening. If there is evidence showing that any bidder is a Jointly Interested Bidder or undertakes any action as an "Obstruction of Fair Price Competition", EGAT shall delete his name from the list of bidders and inform such bidder by written notice hereof.

4.2 The Bidder whose name is deleted according to Article 4.1, may, within fifteen (15) calendar days from the date of receipt of EGAT's written notice, appeal to EGAT, explaining reasons together with relevant documents for EGAT's reconsideration.

In case EGAT agrees with the objection of the appellant but considers that the cancellation of enquiry/bidding will be beneficial to EGAT, EGAT may, at its sole discretion, cancel such bid. In the event that the Bidder who undertakes any action as an "Obstruction of Fair Price Competition" does not appeal or, after his appeal, EGAT does not agree with his objection, such Bidder shall be regarded as a work abandoner.

EGAT's decision shall be notified to the appellant in writing and such decision shall be final and conclusive.

5. Reservation of the Right for Proposal and Others

In case any juristic person is regarded as a work abandoner by EGAT and such abandonment is caused by the manager, the managing partner, the managing director, the executive or the person authorized to manage the business of that juristic person, EGAT shall also include his name as a work abandoner.

In case any juristic person is regarded as a work abandoner by EGAT, such decision shall also be applied to other juristic persons of the same business where its manager, managing partner, managing director, executive, or person authorized to manage the business is the same person who is the manager, managing partner, managing director, executive, or person authorized to manage the business of the juristic person who is regarded as a work abandoner by EGAT as aforesaid.

In case any natural person is regarded as a work abandoner by EGAT, such decision shall also be applied to other juristic persons who submit the proposal and have such natural person as the manager, managing partner, managing director, executive or person authorized to manage the business of such juristic persons

## 1.1 Definitions

These definitions shall apply to the Enquiry, Bid for Supply, Lease, Hire or Work, or Hire of Consultant by Way of Selection.

1.1.1 ***“Jointly Interested Bidder”*** means a natural person or juristic person who submits bid to EGAT for the supply of goods, lease, hire of work, or hire of consultant by way of selection, as the case may be, and who has an interest, either directly or indirectly, in the business of another natural person or juristic person whose bid is also submitted to EGAT in this bidding.

The interest, either direct or indirect, in another natural person or juristic person as aforesaid includes the relationship in the following manners :

- (1) Management relationship, whereby the manager, the managing partner, the managing director, the executive or the person authorized to manage the business of a natural person or a juristic person has the power, or is able to exercise the power, in managing the business of the other one or more natural persons or juristic persons whose bids are also submitted to EGAT in this bidding.
- (2) Capital relationship, whereby a partner in an ordinary partnership or a partner with unlimited liability in a limited partnership or a major shareholder in a limited company or a public limited company is a partner in the other one or more ordinary partnerships or limited partnerships, or is a major shareholder in the other one or more limited companies or public limited companies whose bids are also submitted to EGAT in this bidding.
- (3) Cross relationship between (1) and (2), whereby the manager, managing partner, managing director, executive or person authorized to manage the business of a natural person or juristic person is a partner in the other one or more ordinary partnerships or limited partnerships, or is a major shareholder in the other one or more limited companies or public limited companies whose bids are also submitted to EGAT in this bidding, or *vice versa*.

***“Major shareholder”*** means a shareholder who holds more than twenty five (25) percent of stake in such an enterprise or at another percentage determined by the Governor as he deems expedient for some types or sizes of enterprises.

Holding of position, being a partner or shareholding as aforesaid by the spouse or minor of the person in (1), (2) or (3) shall be deemed the holding of position, being a partner or shareholding by such person.

If any bidder uses the name of another person as the manager, managing partner, managing director, executive, partner or shareholder, but in which case he himself in fact exercises the power in management or he himself is the real partner or shareholder of the partnership or limited company or public limited company, as the case may be, and the related partnership or limited company or public limited company whose bid is also submitted to EGAT in this bidding, that bidder shall be deemed to have a relationship under (1), (2) or (3), as the case may be.



1.1.2 ***“Obstruction of Fair Price Competition”*** means any act committed by a bidder or bidders causing hindrance or obstruction or impeding the opportunity for fair price competition in the tendering of bid to EGAT, whether done by collusion, or by granting, requesting, or agreeing to grant, demand, accept or agreeing to accept money or property or other benefit or by committing an act of violence or by threatening to commit an act of violence or presenting a false document or doing any act in bad faith, with the objective of acquiring benefit among the other bidders or in order to give benefit to any specific bidder so that such person will be entitled to enter into a contract with EGAT or in order to avoid fair price competition, or in order to take advantage to EGAT which not being usual business practices.

DRAFT

## 1.2 Documentary List

This documentary list shall apply to the Enquiry, Bid for Supply, Lease, Hire of Work, or Hire of Consultant by Way of Selection.

		No. of page(s)	For EGAT only	
<b><u>Thai National Bidder</u></b>				
[ ]	1. Where the Bidder is a natural person or a group of persons other than a juristic person			
( )	(a) Natural Person		Yes	No
	- Certified copy of identity card .....		<input type="checkbox"/>	<input type="checkbox"/>
( )	(b) Group of persons			
	- Certified copy of partnership agreement or contract (if any) .....		<input type="checkbox"/>	<input type="checkbox"/>
	- Certified copy of identity card(s) of partners or related documents according to Item 2 (a) and (b) of each participant of the group .....		<input type="checkbox"/>	<input type="checkbox"/>
[ ]	2. Where the Bidder is a juristic person			
( )	(a) Ordinary partnership or limited partnership			
	- Certified copy of affidavit of incorporation .....		<input type="checkbox"/>	<input type="checkbox"/>
	- Name list of managing partners and list of persons entrusted with controlling power (if any) .....		<input type="checkbox"/>	<input type="checkbox"/>
	(Please fill in the form on page 10.)			
( )	(b) Limited company or public limited company			
	- Certified copy of affidavit of incorporation .....		<input type="checkbox"/>	<input type="checkbox"/>
	- Memorandum of Association .....		<input type="checkbox"/>	<input type="checkbox"/>
	- Name list of managing directors and list of persons entrusted with controlling power (if any) .....		<input type="checkbox"/>	<input type="checkbox"/>
	(Please fill in the form on page 10.)			
	- Name list of major shareholders .....		<input type="checkbox"/>	<input type="checkbox"/>
	(Please fill in the form on page 11.)			
[ ]	3. Other documents (if any)			
( )	Certified copy of any other registration required by Ministry of Commerce of Thailand .....		<input type="checkbox"/>	<input type="checkbox"/>
( )	Certified copy of registration for value added tax .....		<input type="checkbox"/>	<input type="checkbox"/>
( )	.....		<input type="checkbox"/>	<input type="checkbox"/>
( )	.....		<input type="checkbox"/>	<input type="checkbox"/>

		No. of page(s)	For EGAT only	
<b><u>Non-Thai National Bidder</u></b>				
[ ]	4. Where the Bidder is a natural person or a group of persons other than a juristic person			
( )	(a) Natural Person		Yes	No
	- Certified copy of passport .....		<input type="checkbox"/>	<input type="checkbox"/>
( )	(b) Group of persons			
	- Certified copy of partnership agreement or contract (if any) .....		<input type="checkbox"/>	<input type="checkbox"/>
	- Certified copy of passport of partners or related documents according to Item 5 of each participant of the group .....		<input type="checkbox"/>	<input type="checkbox"/>
[ ]	5. Where the Bidder is a juristic person			
	- Certified copy of affidavit of incorporation .....		<input type="checkbox"/>	<input type="checkbox"/>
	- Name list of managing partners, directors, etc., as the case may be, and list of persons entrusted with controlling power (if any) .....		<input type="checkbox"/>	<input type="checkbox"/>
	- Memorandum of Association (if any) (Please fill in the form on page 10.) .....		<input type="checkbox"/>	<input type="checkbox"/>
	- Name list of major shareholders (if any) (Please fill in the form on page 11.) .....		<input type="checkbox"/>	<input type="checkbox"/>
[ ]	6. Other documents (if any)			
( )	.....		<input type="checkbox"/>	<input type="checkbox"/>
( )	.....		<input type="checkbox"/>	<input type="checkbox"/>
( )	.....		<input type="checkbox"/>	<input type="checkbox"/>
( )	.....			
( )	.....			

		No. of page(s)	For EGAT only	
<b><u>Thai and Non-Thai National Bidder</u></b>				
[ ]	7. Where the Bidder is a joint venture / consortium		Yes	No
	- Certified copy of association agreement	.....	<input type="checkbox"/>	<input type="checkbox"/>
( )	(a) If participant of a joint venture / consortium is not a juristic person			
	(i) Thai national			
	- Certified copy of identity card	.....	<input type="checkbox"/>	<input type="checkbox"/>
	(ii) Non-Thai national			
	- Certified copy of passport	.....	<input type="checkbox"/>	<input type="checkbox"/>
( )	(b) If participant of a joint venture / consortium is a Thai-national juristic person			
	( ) (i) Ordinary partnership or limited partnership			
	- Certified copy of affidavit of incorporation	.....	<input type="checkbox"/>	<input type="checkbox"/>
	- Name list of managing partners, and list of persons entrusted with controlling power (if any) (Please fill in the form on page 10.)	.....	<input type="checkbox"/>	<input type="checkbox"/>
	( ) (ii) Limited company or public limited company			
	- Certified copy of affidavit of incorporation	.....	<input type="checkbox"/>	<input type="checkbox"/>
	- Memorandum of Association	.....	<input type="checkbox"/>	<input type="checkbox"/>
	- Name list of managing directors, and list of persons entrusted with controlling power (if any) (Please fill in the form on page 10.)	.....	<input type="checkbox"/>	<input type="checkbox"/>
	- Name list of major shareholders (Please fill in the form on page 11.)	.....	<input type="checkbox"/>	<input type="checkbox"/>

		No. of page(s)	For EGAT only	
			Yes	No
( )	(c) If member of a joint venture / consortium is a Non-Thai national juristic person			
-	Certified copy of affidavit of incorporation	.....	<input type="checkbox"/>	<input type="checkbox"/>
-	Name list of managing partners, directors, etc., as the case may be, and list of persons entrusted with controlling power (if any) (Please fill in the form on page 10.)	.....	<input type="checkbox"/>	<input type="checkbox"/>
-	Memorandum of Association (if any)	.....	<input type="checkbox"/>	<input type="checkbox"/>
-	Name list of major shareholders (if any) (Please fill in the form on page 11.)	.....	<input type="checkbox"/>	<input type="checkbox"/>
[ ]	8. Other documents (if any)			
( )	Certified copy of any other registration required by Ministry of Commerce of Thailand	.....	<input type="checkbox"/>	<input type="checkbox"/>
( )	Certified copy of registration for value added tax in Thailand	.....	<input type="checkbox"/>	<input type="checkbox"/>
( )	.....	.....	<input type="checkbox"/>	<input type="checkbox"/>
( )	.....	.....	<input type="checkbox"/>	<input type="checkbox"/>
( )	.....	.....	<input type="checkbox"/>	<input type="checkbox"/>

We hereby confirm that all documents detailed above are true and correct.

Signed

\_\_\_\_\_  
(Name of Bidder)

stamp company seal (if any)

List of Names of Manager / Managing Partner / Managing Director / Executive /  
Person Who Is Authorized to Manage the Business  
(Relationship in Management)

Bidder shall fill in and submit this form with his bid

Enquiry / Bid No : ..... Enquiry / Bid Opening Date : .....

Name of Company / Partnership / Juristic Person : .....

No.	Name – Surname	Position	Name – Surname of Spouse	Name – Surname of Minor

We hereby confirm that all documents submitted are true and correct.

Signed \_\_\_\_\_  
(Name of Bidder)

Stamp company seal (if any)

Remarks

1. The unused wordings shall be struck out.
2. Duplicate this page as necessary.

List of Partner in Ordinary Partnership / Partner with Unlimited Liability in Limited Partnership /  
Major Shareholder in Limited Company or Public Limited Company  
(Relationship in Capital)

Bidder shall fill in and submit this form with his bid

Enquiry / Bid No. : ..... Enquiry / Bid Opening Date : .....

Name of Company / Partnership / Juristic Person : .....

Registered Capital : (currency)..... Number of Share : ..... Price per Share : (currency).....

No.	Name - Surname	Position	Number of Share (%) or Amount of Shareholder's Equity	Name – Surname of Spouse	Number of Share (%) or Amount of Shareholder's Equity	Name – Surname of Minor	Number of Share (%) or Amount of Shareholder's Equity

We hereby confirm that all documents submitted are true and correct.

Signed.....

(Name of Bidder)

Stamp company seal (if any)

Remarks

1. The unused wordings shall be struck out.
2. “Major Shareholder” means a shareholder who holds more than twenty-five (25) per cent of stake in an enterprise. The shareholding of spouse or minor of a person shall be regarded as being the shareholding of such person. In case of no major shareholder, please specify “No major shareholder” in the tabulation above.
3. Duplicate this page as necessary.
4. The Bidder shall submit List of Names of Manager/ Managing Partner/ Managing Director/ Executive/ Person Who Is Authorized to Manage the Business (Relationship in Management)/ and List of Partner in Ordinary Partnership/ Partner with Unlimited Liability in Limited Partnership/ Major Shareholder in Limited Company or Public Limited Company (Relationship in Capital) of the Bidder as per page 10-11 of this Additional Regulation.

# **Important Information**

## **for**

### **Invitation to Bid No. NPUP-L-04**

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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:

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

According to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017), the article has been revised as per Data Sheet.

#### **Article A-6. Preparation and Delivery of Bids and Article B-1. Preparation of Bids**

Details on how to prepare the proposal have been revised. Bids shall be prepared in accordance with the Instructions to Bidders contained in the Bidding Documents in one (1) original hard copy and one (1) electronic copy contained in USB flash drive.

#### **Article A-6. Preparation and Delivery of Bids**

Details of technical proposal opening time and place shall be specified in the Tentative Schedule.

#### **Article A-7. Availability of Bidding Documents**

Availability of Bidding Documents has been changed from CD-ROM to electronic files for download via link provided by EGAT.

#### **Channel of Documents Submission**

For channel of document submission in the hereunder Articles, facsimile and telex has been replaced with letters submitted electronically or electronic mails (E-mails).

- Article B-1. Preparation of Bids
- Article B-4. Validity of Bids
- Article D-9. Notices
- Article E-20. Documents Required for Each Shipment
- Article F-10. Payment
-



## **Section B : Overview of the Procurement Process**

The procurement process diagram has been updated.

### **Article B-2. Bid Prices**

For 1. Prices for Equipment, Prices for Equipment manufactured outside Thailand (imported Equipment) shall be firm CIF Thai Port basis and quoted in Thai baht, US dollar, euro, Japanese yen, renminbi (Chinese yuan), or in the Bidder's or Manufacturer's home currency only if his currency trading is prevailed at the time of bidding in any international market other than in Bidder's or Manufacturer's home country.

The following paragraph has also been added :-

“Prices for the following Equipment manufactured outside Thailand which was imported before the technical proposal opening date shall be firm ex-works and quoted in Thai baht, provided that the Bidder shall submit any document(s) evidencing the importation date of such Equipment:

- Joint box for optical fiber cable”

### **Article B-8. Information to be Submitted with Bid**

According to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017), the article has been revised as per Data Sheet.

### **Article E-19. Shipment**

The Maritime Promotion Bureau has been updated to the Maritime Promotion Division and its contact information has also been updated.

### **Article F-10. Payment**

After each payment is made, the Contractor or beneficiary shall issue and submit the receipt to EGAT as detailed in the paragraph added at the end of this article.

According to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017), the article has been revised as per Data Sheet.

DRAFT

**DATA SHEET**

**DATA SHEET**  
**for**  
**Invitation to Bid No. NPUP-L-04**  
**(Two-envelope)**

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

1. Article A-3. Eligibility of Bidders: General Requirements

The following requirement shall be added to Article A-3. Eligibility of Bidders: General Requirements, item I.:

- j. Bidders shall provide written minimum standards of the policy and directions for anti-corruption in relation to procurement together with supporting evidence pursuant to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017).*

2. Article B-3. Bid Security

The amount of bid security shall be USD 1,706,230.- or THB 53,328,500.-.

3. 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.

4. 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:

- y. Bidder's minimum standards of the policy and directions for anti-corruption in relation to procurement, together with the completely filled out Anti-Corruption Compliance Checklist as provided, and supporting evidence.*

*Where the Bidder holding a certification under ISO 37001 Anti-Bribery Management Systems, certification from the Thai Private Sector Collective Action against Corruption (CAC Certified), or any certification as prescribed by the Anti-Corruption Co-operation Committee, shall be deemed to have satisfied the minimum standards of the policy and directions for anti-corruption in relation to procurement. Such certification documents may be submitted as part of the bid.*

*Such minimum standards of the policy and directions for anti-corruption in relation to procurement, or the certification, shall remain valid and effective from the technical proposal opening date.*

5. Article F-10. Payment

*The following paragraphs shall be added as the last two paragraphs of this article:*

*“ Please note that the Contractor shall provide written minimum standards of the policy and directions for anti-corruption in relation to procurement or a certification of anti-corruption standards that are valid until the date of receipt of the final payment under the Contract.*

*In the case where EGAT finds that the validity period of the Contractor's submitted minimum standards of the policy and directions for anti-corruption in relation to procurement, or the relevant certification, will expire before the date of receipt of the final payment under the Contract, EGAT shall issue a written notification to the Contractor requiring the submission of a revised or updated, completely filled out Anti-Corruption Compliance Checklist together with supporting evidence, prior to the expiration date of the existing Anti-Corruption Compliance Checklist. ”*

**SECTION A**  
**INVITATION TO BID**

# **ELECTRICITY GENERATING AUTHORITY OF THAILAND**

Nonthaburi  
Thailand

## **INVITATION TO BID NO. NPUP-L-04**

### **SUPPLY AND CONSTRUCTION OF TRANSMISSION LINES 500 kV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI) AND SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO TO DEN CHAI SUBSTATION**

### **TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS (TWO-ENVELOPE)**

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#### **A-1. Invitation**

The Electricity Generating Authority of Thailand (EGAT) hereby invites sealed bids for Supply and Construction of Transmission Lines 500 kV Nan – Den Chai (From KM. 63 to Den Chai) and Sectionalizing of 500 kV Mae Moh 3 – Tha Tako to Den Chai Substation under Transmission System Development in the Area of Nan Phrae and Uttaradit Provinces for Power Purchase from Lao PDR Projects in accordance with the Terms and Conditions, Technical Specifications and Drawings described in these Bidding Documents.

#### **A-2. Work Description**

This invitation is consisted of three (3) Schedules as described below:

##### **Schedule 1: Supply and Construction of 500 kV Nan – Den Chai (From KM.63 to Den Chai) Transmission Line**

The transmission line to be supplied and constructed under this Schedule is 500 kV, 50 Hz, 3 phase, quad-bundled conductor per phase, on double-circuit on self-supporting lattice steel towers extending from KM.63 to Den Chai Substation, having a distance of approximately 63.6 kilometers in length as the second section of the 500 kV Nan – Den Chai Transmission Line in the northern region of Thailand with a total distance of approximately 126.8 kilometers. This transmission line will be located on the new right-of-way with 30 meters in width on each side of the center line of the transmission.

Please note that the first section of the whole 500 kV Nan – Den Chai Transmission Line to be constructed from Nan Substation to KM.63 will be undertaken under Invitation to Bid No. NPUP-L-02.

The work at the connection point for both sections as shown in the Drawing No. T05-001: Interfacing Work will be undertaken under this Invitation.

The conductor to be employed under this Invitation will be 1272 MCM ACSR/GA supplied by EGAT. Two types of shield wires will be employed; one of which is 3/8 inches nominal diameter, extra high strength galvanized steel shield wire and the other is composite overhead ground wire with 36-core optical fiber. Both types of shield wires shall be supplied by the Contractor.

Schedule 2: Supply and Construction of Transmission Line for Sectionalizing of 500 kV Mae Moh 3 – Tha Tako (Circuit No.1 and Circuit No.4) to Den Chai Substation

The transmission line to be supplied and constructed under this Schedule is 500 kV, 50 Hz, 3 phase, quad-bundled conductor per phase, on double-circuit on self-supporting lattice steel towers extending from existing tower No.48/3 type DQV9(3) at Den Chai Junction (West) to Den Chai Substation to be operated as 500 kV Mae Moh 3 – Den Chai (Circuit No.1 and Circuit No.4), having a distance of approximately 3 kilometers in length and extending from Den Chai Substation to existing tower No.49/1 type DQV3 at Den Chai Junction (West) to be operated as 500 kV Den Chai – Tha Tako (Circuit No.1 and Circuit No.4), having a distance of approximately 3 kilometers in length in the northern region of Thailand with a total distance of approximately 6 kilometers. This transmission line will be located on the new right-of-way with 30 meters in width on each side of the center line of the transmission.

The conductor to be employed under this Invitation will be 1272 MCM ACSR/GA supplied by EGAT. Two types of shield wires will be employed; one of which is 3/8 inches nominal diameter, extra high strength galvanized steel shield wire and the other is composite overhead ground wire with 36-core optical fiber. Both types of shield wires shall be supplied by the Contractor.

Schedule 3: Supply and Construction of Transmission Line for Sectionalizing of 500 kV Mae Moh 3 – Tha Tako (Circuit No.2 and Circuit No.3) to Den Chai Substation

The transmission line to be supplied and constructed under this Schedule is 500 kV, 50 Hz, 3 phase, quad-bundled conductor per phase, on double-circuit on self-supporting lattice steel towers extending from existing tower No.55/1 type DL(3) to Den Chai Substation to be operated as 500 kV Mae Moh 3 – Den Chai (Circuit No.2 and Circuit No.3), having a distance of approximately 0.5 kilometers in length and extending from Den Chai Substation to existing tower No.55/3 type DM(3) to be operated as 500 kV Den Chai – Tha Tako (Circuit No.2 and Circuit No.3), having a distance of approximately 0.7 kilometers in length in the northern region of Thailand

with a total distance of approximately 1.2 kilometers. This transmission line will be located on the new right-of-way with 30 meters in width on each side of the center line of the transmission.

The conductor to be employed under this Invitation will be 795 kcmil ACSR/GA (CONDOR) supplied by EGAT. 3/8 inches nominal diameter, extra high strength galvanized steel shield wire will be employed and shall be supplied by the Contractor.

The dismantling Work of the existing 500 kV Mae Moh 3 – Tha Tako Transmission Line (Circuit No.2 and Circuit No.3) which is double circuit strung with quad-bundled 795 kcmil ACSR/GA (CONDOR) between the existing Tower No.55/1 type DL(3) and the existing Tower No.55/3 type DM(3), having a distance of approximately 0.8 kilometers, shall also be performed under this Schedule. The dismantling Work shall be conducted in accordance with the requirements in Specifications No.TL-07 (Rev.3): Dismantling Work. List of dismantled Equipment to be purchased by the Contractor is shown in Attachment No. 2: List of Equipment to be Dismantled by the Contractor. Conditions regarding the purchase of the dismantled Equipment are stipulated in Attachment No. 3: Requirements for Dismantling Work and Conditions of Sale of Dismantled Equipment.

All the drawings including Structural design, the fabrication/erection drawings, stub & setting dimensions for all tower types, as well as details & bar bending schedule for all foundation types including pile foundation shall be prepared and submitted for EGAT's approval by the Contractor. It shall also be noted that the modifications and re-design for towers and foundations may be required. In such case, the Contractor shall perform and provide these drawings for EGAT's approval.

Reproducible drawings and CD-ROM of the drawings for towers, stub & setting dimensions, including details & bar bending schedule of foundations as well as for modified and re-designed towers and foundations (if any) shall be required to be submitted to EGAT by the Contractor.

The full responsibility for adequacy and accuracy of all detailed drawings shall rest with the Contractor and he shall have no right to claim for additional compensation as a result of his misinterpretation or failure to check the drawings for compliance with the design requirements, inaccuracies, errors and omissions.

The Contractor shall also be responsible for the design of any other necessary parts for completion of the Work, including the manufacture, supply, testing, construction and installation of the various components of the transmission line.

Services required to complete the Work are shown in the Bid Price Schedules and included in these Bidding Documents.



**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 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 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 proceedings under Thai Court; provided that such Bidder's government declares that such special privilege is waived.
- h. In case of being a joint venture or a 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 *technical proposal* 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 funds 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. Himself, or either firm of the joint venture/consortium, having a record of experience in executing at least one (1) turnkey contract as contractor (not as subcontractor) in overseas country (not his own country) or with EGAT on a multi but not less than four-bundled conductor transmission line of 400 kV or higher; having a circuit distance of not less than thirty (30) kilometers.

However, the exception will be allowed for the following cases:

- 1) For foreign firm not having experiences in executing turnkey contract(s) in overseas or with EGAT as mentioned above, his experiences in executing at least five (5) turnkey contracts as contractor (not as subcontractor) in his own country on a multi but not less than four-bundled conductor transmission line of 400 kV or higher, with the circuit distance of the transmission line for each contract being not less than thirty (30) kilometers is eligible in case that he proposes his bid as a joint venture with a local (Thai) firm who has an experience in executing at least two (2) turnkey contracts as contractor (not as subcontractor) with EGAT on supply and construction of transmission line at a voltage level of 230 kV or higher, having a circuit distance of the transmission line for each contract not less than thirty (30) kilometers and one of which shall be a two-bundled conductor transmission line.
- 2) For local firm or the joint venture/consortium of local firms, himself or either firm of the joint venture/consortium having an experience in executing at least one (1) turnkey contract as contractor (not as subcontractor) with EGAT on a four-bundled conductor transmission line at a voltage level of 230 kV or higher is eligible to the requirement under this Item.

Experience record of the Bidder or either firm of the joint venture/consortium, including experience record derived from being a firm of other joint venture or consortium in previous project(s) is

acceptable. It is not allowed to combine the experience records of each firm of the joint venture/consortium in order to meet the experience requirements.

- b. Himself, or either firm of the joint venture/consortium or the combination thereof, having excellent reputation, and adequate technical knowledge and experience in construction of extra high voltage transmission lines, and involving accumulated circuit distance in excess of 200 kilometers for multi but not less than four-bundled conductor transmission line of 400 kV or higher having been successfully operated for at least one (1) consecutive year.

The record of such construction experience as well as a successful operation as required above shall be of the Work executed by the Bidder no longer than fifteen (15) years before the date specified for opening of this Bid.

However, for local firm or the joint venture/consortium of local firms further to the exception case of eligible bidders as mentioned in a.2), an experience of his or either firm of the joint venture/consortium in construction of four-bundled conductor transmission line at a voltage level of 230 kV or higher having received Provisional Acceptance from EGAT is eligible to the requirement under this Item.

- c. Himself, or either firm of the joint venture/consortium or his subcontractor or the combination thereof, having excellent reputation and adequate technical knowledge and at least three (3) years experience in the completed construction of transmission line with end user's acceptance having accumulative distance of overhead ground wire with optical fiber not less than 20 kilometers in length. This eligibility will not be applicable if such Equipment is not required under this Invitation.

With respect to item b. and c., experience record of the Bidder or either firm of the joint venture/consortium, including experience record derived from being a firm of other joint venture or consortium in previous project(s) is acceptable, provided that there is a letter from the project owner certifying that the Works as described in b. and c. above were performed by the Bidder or either firm of the joint venture/consortium of this project.

However, reference records of either the parent or affiliated companies of the Bidder or of either firm of the joint venture/consortium shall not be acceptable. 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.

- d. Proposing towers, conductor, insulators for conductor, hardware assemblies and line accessories for conductor, rigid spacers and spacer dampers for conductor, and composite overhead ground wire with optical fiber (OPGW) manufactured by regular manufacturers of excellent reputation having significant technical knowledge and at

least three (3) years experience in the design, manufacture and testing of such Equipment, having manufacturing capacity available to perform the Work properly and expeditiously within the time specified, and having satisfactory past experience, with additional requirements as follows:

- 1) Tower manufacturer being an eligible local firm having set up a plant for fabrication of steel towers in Thailand
- 2) Hardware assemblies and line accessories for conductor manufacturer being an eligible local firm having set up a plant in Thailand
- 3) Rigid spacer and spacer damper for conductor manufacturer being an eligible local firm having set up a plant in Thailand
- 4) Insulator for conductor manufacturer having a record of three (3) consecutive years of successful operation/use of at least 100,000 units of insulator ANSI Class 52-8 or similar and at least 20,000 units of insulator ANSI Class 52-11 or similar in transmission line(s) operated in the transmission network electric utility in overseas country (not his own country) at a voltage level of 400 kV or higher during the last ten years
- 5) Spacer dampers for conductor manufacturer having a record of five (5) consecutive years of successful operation/use of the same or similar type as those required under this Invitation and used in multi but not less than four-bundled conductor transmission lines operated at a voltage level of 400 kV or higher having accumulated circuit distance of not less than 200 kilometers
- 6) Composite overhead ground wire with optical fiber (OPGW) manufacturer having a record of at least three (3) consecutive years of successful operation/use of the same or similar type as those required under this Invitation in the transmission line having accumulated distance of not less than 20 kilometers
- 7) For proposed conductor, according to the Industrial Product Standards Act B.E. 2511 which stipulates that the conductor is an industrial product that is required to conform with the Thai Industrial Standards – TIS 85-2548;

In case of locally supplied conductor, the manufacturer of the conductor shall receive a license from the Industrial Product Standards Council, Ministry of Industry, for manufacture of the industrial product and use of a standard mark, and

In case of foreign supplied conductor, the conductor shall be imported by a person having received a license from the Industrial Product Standards Council, Ministry of Industry, for importation of the industrial product.

However, the Bidder may propose any qualified local manufacturer who does not have experience in design, manufacture and testing as well as a record of successful operation/use of his Equipment as specified above but has obtained special permission from EGAT for manufacture and/or fabrication of the specific Equipment within the scope specified in the letter of permission issued by EGAT, or propose any local manufacturer who is in the list of Eligible Local Manufacturers Accepted by EGAT as shown herein at the end of this Section.

In the event that the Bidder proposes the Equipment of the manufacturer who, at the time of bidding, fails to meet with requirements of any contract(s) with EGAT regarding major defects or malfunctioning of such Equipment, and such failure has not yet satisfactorily been proved to and/or settled with EGAT, EGAT reserves the right to reject his Bid.

This eligibility will not be applicable for any Equipment which is not required under this Invitation.

All experiences, successful operation, successful operation/use and requirements to be submitted under this Bid shall not be later than Bid opening date.

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

- a. Having sufficient capacity to carry out the Work.
- b. Proposing shield wire, insulators for shield wire and for OPGW, hardware assemblies and line accessories for shield wire and for OPGW, grounding materials, fiber optic transmission system Equipment, and other Equipment manufactured by regular manufacturers of excellent reputation having significant technical knowledge and at least three (3) years experience, in the design, manufacture and testing of such Equipment, having manufacturing capacity available to perform the Work properly and expeditiously within the time specified, and having satisfactory past experience, with additional requirements as follows:
  - Manufacturers for shield wire (zinc-coated extra high strength steel wire), hardware assemblies and line accessories for shield wire and for OPGW, and non-metallic optical fiber cable (OFC) being an eligible local firm having set up a plant in Thailand

However, the Bidder may propose any qualified local manufacturer who does not have experience in design, manufacture and testing as well as a record of successful operation/use of his Equipment as specified above but has obtained special permission from EGAT for manufacture and/or fabrication of the specific Equipment within the scope specified in the letter of permission issued by EGAT, or

propose any local manufacturer who is in the list of Eligible Local Manufacturers Accepted by EGAT as shown herein at the end of this Section.

In the event that the Bidder proposes the Equipment of the manufacturer who, at the time of bidding, fails to meet with requirements of any contract(s) with EGAT regarding major defects or malfunctioning of such Equipment, and such failure has not yet satisfactorily been proved to and/or settled with EGAT, EGAT reserves the right to reject this Bid.

This eligibility will not be applicable for any Equipment which is not required under this Invitation.

All experiences, successful operation, successful operation/use and requirements to be submitted under this Bid shall not be later than Bid opening date.

- c. Proposing reputable subcontractors, for the portion of the Work to be subcontracted, having adequate technical knowledge, ability and capacity and practical experience to perform such work. 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.
- d. Having no just or proper claims pending against him with respect to breach in the performance of Contract on other similar works awarded by EGAT. 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.
- e. Himself or his subcontractors, at the time of submitting this proposal, not carrying excessive work or not being 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.

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

#### **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 *hard copy and one (1) electronic copy contained in USB flash drive*, 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 in a separate envelope.

*For preparation of original hard copy, each page of the original hard copy shall be marked with the volume number and the page number in the lower right-hand corner, for example, Volume 1 of 10 and Page 1 of 100.*

*For preparation of electronic copy, each volume of the signed original hard copy shall be scanned into one (1) PDF file and each PDF file shall be named according to the volume number.*

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

Envelope I which shall *consist of the original hard copy of technical proposal, and a USB flash drive containing the electronic files of the original technical proposal in PDF and Excel format, as required by EGAT, and*

Envelope II which shall *consist of the original hard copy of price proposal, and a USB flash drive containing the electronic files of the price proposal in PDF and Excel format, as required by EGAT.*

*In the event of any discrepancy between the original hard copy and the electronic copy, the original hard copy shall govern.*

**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. NPUP-L-04

SUPPLY AND CONSTRUCTION OF TRANSMISSION LINES  
500 kV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI)  
AND SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO  
TO DEN CHAI SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN  
PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM  
LAO PDR PROJECTS

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.
- h. USB flash drive containing electronic files of the original technical proposal in the following formats :-***
  - PDF files of all pages of each volume of the technical proposal, and***
  - Excel files of filled-in Proposal Data.***

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. NPUP-L-04

SUPPLY AND CONSTRUCTION OF TRANSMISSION LINES  
500 kV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI)  
AND SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO  
TO DEN CHAI SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN  
PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM  
LAO PDR PROJECTS

PRICE PROPOSAL

The Envelope **II** for the price proposal shall contain the following :

- a. price schedules according to Section C;
- b. ***Discount Form***
- c. ***USB flash drive containing electronic files of the price proposal in the following formats :-***
  - ***PDF files of all pages of each volume of the price proposal, and***
  - ***Excel files of filled-in Price Schedule***

The technical proposal and the price proposal shall be addressed and delivered to **EGAT**, 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 the ***place and*** time specified ***in Tentative Schedule.***

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 are available for examination *and online purchase at <http://www4.egat.co.th/fprocurement/biddingeng/>* and can be obtained *by downloading via links provided by EGAT* upon payment to EGAT, non-refundable, in the amount of USD.....500.- or Baht 15,000.- prices include the value added tax.

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.

## **ELIGIBLE LOCAL MANUFACTURERS ACCEPTED BY EGAT**

The following local manufacturers are eligible for proposing each specific equipment for this Invitation; provided that the scope of their offerings shall be within that specified in the Certificate of Acceptance issued by EGAT.

### **1) STEEL TOWERS**

#### **Ajikawa & SCI Metal Tech Co., Ltd.**

49/1 Moo 9, Marppong  
Phantong  
Chonburi 20160  
Tel : 038 451 473-6  
Fax : 038 451 478

#### **Siam Steel Tower Co., Ltd.**

9/10 Moo 10 Tambol Koke-Yae  
Amphur Nong Khae  
Saraburi 18230, Thailand  
Tel : (662) 705-8755-63  
Fax : (662) 705-8765

#### **Thai-Scandic Steel Company Limited**

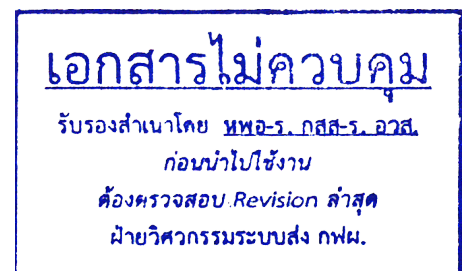
7 I-5 Road, Maptaphut Industrial Estate  
Amphur Muang  
Rayong 21150  
Tel : (66-38) 683070  
Fax : (66-38) 683065

#### **Sky Tower Public Company Limited**

247 Romklao Road  
Saensaeab  
Minburi, Bangkok 10510  
Thailand  
Tel : 662-543-9020-8  
Fax : 662-915-2114, 915-2714, 543-9029

#### **Demco Power Company Limited**

59 Moo 1, Suanphrikthai  
Muangpathumthani  
Pathumthani 12000  
Tel : 0 2959 5811 Ext.1612  
Fax : 0 2959 5915



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*Sorachich Hiraman*

2) **HARDWARE ASSEMBLIES AND LINE ACCESSORIES FOR CONDUCTOR, OVERHEAD GROUND WIRE AND OPGW**

**Preformed Line Products (Thailand ) Ltd.**

296 Moo 4, Lardkrabang Industrial Estate  
EPZ 3 Chalongkrung Road  
Lumpratew, Lardkrabang  
Bangkok 10520  
Tel : 0 2739 4026  
Fax : 0 2326 0564

- (For 1. Hardware assemblies and line accessories (except damper) for single, twin-bundled and quad-bundled conductor for 115 kV, 230 kV and 500 kV transmission lines  
2. Hardware assemblies and line accessories (except damper) for overhead ground wire and OPGW  
3. Vibration dampers for conductor, overhead ground wire and OPGW  
4. Spacer dampers and rigid spacers for twin-bundled and quad-bundled conductor for 115 kV, 230 kV and 500 kV transmission lines)

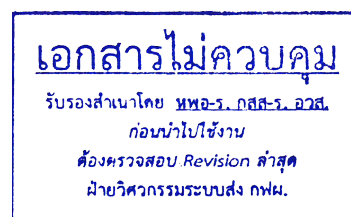
**Dulhunty Power (Thailand) Co., Ltd.**

1/5 Moo 3  
Nam Daeng  
Muang Chachoengsao  
Chachoengsao 24000  
Tel : 033 590 841  
Fax : 033 590 842

- (For 1. Hardware assemblies and line accessories (except damper) for single, twin-bundled and quad-bundled conductor for 115 kV, 230 kV and 500 kV transmission lines  
2. Hardware assemblies and line accessories (except damper) for overhead ground wire and OPGW  
3. Vibration dampers for conductor, overhead ground wire and OPGW  
4. Spacer dampers and rigid spacers for twin-bundled and quad-bundled conductor for 115 kV, 230 kV and 500 kV transmission lines)

**Mosdorfer (Thailand) Co., Ltd.**

10/96 The Trendy Building, 6<sup>th</sup> floor  
Soi Sukhumvit 13 (Sangjan)  
Klong Toey Nuea, Wattana  
Bangkok 10110  
Tel : 02 182 8351  
Fax : 02 182 8350



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- (For 1. Hardware assemblies and line accessories (except damper) for single, twin-bundled and quad-bundled conductor for 115 kV, 230 kV and 500 kV transmission lines  
2. Hardware assemblies and line accessories (except damper) for overhead ground wire and OPGW  
3. Vibration dampers for conductor, overhead ground wire and OPGW  
4. Spacer dampers and rigid spacers for twin-bundled and quad-bundled conductor for 115 kV, 230 kV and 500 kV transmission lines)

*Sorachit Hiraman*

3) **OVERHEAD GROUND WIRE**

**Thai Wire Products Public Company Limited**

99/2 MOO 8 ZEER STREET BUILDING 7TH FL  
Phahonyothin Road, Lamlookka  
Pathum Thani 12130  
Tel : 0 2992 6863-7  
Fax : 0 2992 6870-1

**USHA Siam Steel Industries Public Company Limited**

209/1 K-Tower-B. 22<sup>nd</sup> Floor  
Unit 3/1 Sukhumvit 21 Road (Asok)  
Bangkok 10110  
Tel : 0 2261 7361-4  
Fax : 0 2640 8227

**Charoong Thai Wire & Cable Public Company Limited**

589/71 Central City Tower  
Floor 12A, Bangna-Trad Road  
Bangna, Bangna District  
Bangkok 10260  
Tel : 0 2745 6118  
Fax : 0 2745 6131-32

4) **GROUNDING MATERIALS**

**K.M.L. Technology Co., Ltd.**

100/3 Thasabansongkrow Road  
Ladyao, Jatujak  
Bangkok 10900  
Tel : 0 2954 3455  
Fax : 0 2591 7891

**G.K. Assembly Co., Ltd.**

110/9-10 Moo 2  
Maha Sawat, Bang Kruai District  
Nonthaburi 11130  
Tel : 0 2985 2250-3  
Fax. 0 2985 1910

**เอกสารไม่ควบคุม**

รับรองสำเนาโดย พ.อ.ร. กสส.ร. อวส.  
ก่อนนำไปใช้งาน  
ต้องตรวจสอบ Revision สำสุด  
ฝ่ายวิศวกรรมระบบส่ง กฟผ.

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*Soravit Himmaman*

5) **CONDUCTOR**

**Bangkok Cable Co., Ltd.**

187/1 Rajdamri Road  
Lumpinee, Pathumwan  
Bangkok 10330  
Tel : 0 2254 4550-6  
Fax : 0 2253 5973, 0 2253 6028, 0 2254 3859

**Charoong Thai Wire & Cable Public Company Limited**

589/71 Central City Tower  
Floor 12A, Bangna -Trad Road  
Bangna, Bangna District  
Bangkok 10260  
Tel : 0 2745 6118  
Fax : 0 2745 6131-32

**Phelps Dodge International (Thailand) Limited**

16<sup>th</sup> Floor, Maneeya Center Building  
518/5 Ploenchit Road  
Lumpinee, Pathumwan  
Bangkok 10330  
Tel : 0 2652 0588, 0 2680 5862  
Fax : 0 2680 5896

**Thai-Yazaki Electric Wire Co., Ltd.**

21<sup>st</sup> Floor, O-NES Tower,  
6 Sukhumvit Soi 6  
Klongtoey Sub-District  
Klongtoey District  
Bangkok 10110  
Tel : 0 2653 2550  
Fax : 0 2653 2613-14

**Venine Cable Electric Wire Company Limited**

88/8-9 Moo 2 Ladbualuang-Maitra Rd.  
Ladbualuang, Ladbualuang  
Ayutthaya 13230  
Tel : 0 3528 0493  
Fax : 0 3528 0494

**เอกสารไม่ควบคุม**

รับรองสำเนาโดย **พพอ-ร. กสส-ร. อวส.**

ก่อนนำไปใช้งาน

ต้องตรวจสอบ .Revision สำสุด

ฝ่ายวิศวกรรมระบบส่ง กฟผ.

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*Sorachit Hiraman*

**Fuhrer Wire and Cable Co., Ltd.**

70 Moo 2, Bankao-Panthong Road

Panthong

Chonburi 20160

Tel : 0 3845 2906-7

Fax : 0 3845 2899

(For manufacturing of Transmission Line Conductor up to 230 kV)

6) **NON-METALLIC OPTICAL FIBER CABLE (OFC)**

**Thai China Fiber Optics Co., Ltd.**

488 Soi Ratchadapisek 26,

Samsennog, Huaykwang,

Bangkok 10310

Tel : 0 2975 9901

Fax : 0 2975 9925

**HBC Telecom Co., Ltd.**

187/1 Rajadamri Road,

Lumpinee, Pathumwan

Bangkok 10330

Tel : 0 2650 5002 To 3 Ext.111,112

Fax : 0 2651 9261

**Siam Fiber Optics Co., Ltd.**

Floor 12 A, Central City Tower

589/71 Bangna-Trad Road, Km.3

Bangna, Bangna,

Bangkok 10260

Tel : 0 2745 6118-30

Fax : 0 2745 6575

7) **CROSS-LINKED POLYETHYLENE (XLPE) CABLE**

**Phelps Dodge International (Thailand) Limited**

16th Floor, Maneeya Center Building

518/5 Ploenchit Road

Lumpinee, Pathumwan

Bangkok 10330

Tel : 0 2652 0588, 0 2680 5862

Fax : 0 2680 5896

(For 230 kV Underground Transmission Line with XLPE Cable)

It shall be noted that the 230 kV XLPE Cable is allowed to be supplied to only one contract at the first stage. Any further contracts shall be allowed after the said Equipment under the first contract is certified by a certification letter issued by EGAT that it has been provided at least one (1) year successful operation in EGAT system.

**เอกสารไม่ควบคุม**

รับรองสำเนาโดย นพอ.ร. กสส-ร. อวส.

ก่อนนำไปใช้งาน

ต้องตรวจสอบ Revision ล่าสุด

ฝ่ายวิศวกรรมระบบส่ง กฟผ.

1 ธันวาคม 2568

*Sorachit Hiraman*

**SECTION B**  
**INSTRUCTIONS TO BIDDERS**



## **INSTRUCTIONS TO BIDDERS**

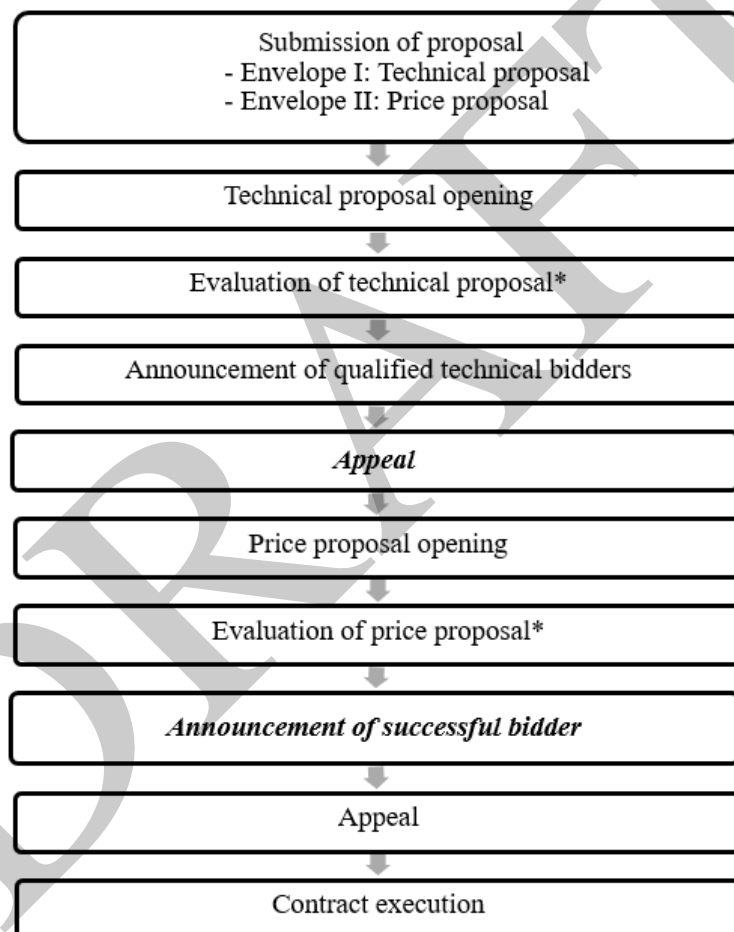
### **Overview of the Procurement Process**

Bid prices and the Contract Price shall include value added tax (VAT) imposed under the law of Thailand. The medium cost announced by EGAT is inclusive of VAT and other relevant expenses.

The amounts of performance security, advance payment security, maintenance security, and liquidated damages shall also be based on the Contract Price which is inclusive of VAT (if any).

For evaluation and comparison of Bids, the bid price shall be evaluated according to the conditions specified in the bidding document.

The procurement process is summarized in the following diagram.



### **\*Remarks**

1. The Bidder shall be deemed to have carefully examined all of the terms, conditions and Specifications of the Bidding Documents.
2. EGAT will take into consideration the conformity of the bid to the requirements of the Bidding Documents as well as the suitability for the purpose intended.
3. EGAT will not be bound to accept the bid with the lowest indicated cost. EGAT reserves the right to accept the bid which in its judgement is the lowest evaluated bid.

## **B-1. Preparation of Bids**

- a. Bids shall be prepared in English, in one (1) original *hard copy clearly marked "Original" and one (1) electronic copy contained in USB flash drive*, and submitted at the place and time specified for receipt of bids.

In the event of any discrepancy between *the original hard copy and the electronic copy, the original hard copy* shall govern.

- b. Bidder shall submit only one (1) proposal.
- c. The "Original" shall be prepared on the bid forms included and made a part of the Bidding Documents, which shall be submitted with all applicable blanks in the bid forms properly filled in, and shall be manually signed in ink by a person or persons duly authorized. The letter of authorization shall be indicated by written power-of-attorney accompanying the bid.

The bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the bid. All pages of the bid, except for unamended printed literature, shall be initialed by the person or persons signing the bid.

- d. Modification by letter or *by letter submitted electronically or by electronic mail (E-mail) to* bids already submitted will be considered if received prior to the time fixed for the receipt of bids. Confirmation by letter of any modification evidenced by post mark or by *letter submitted electronically or by electronic mail (E-mail)* should be sent to EGAT not later than the deadline for submission of Bids.
- e. No Bidder will be permitted to alter his bid after the bids have been opened, but clarification not changing the substance of the bid or prices therein may be accepted.

### **I. Technical Proposal**

- a. Technical proposals will be reviewed to determine the compliance with the Specifications and requirements. Letters conveying the evaluation results will be sent to each Bidder.
- b. *For Proposal Data, Bidder shall fill in information of Proposal Data in Excel file contained in the Bidding Documents, and submit one (1) original hard copy with the Excel and PDF file in USB flash drive to EGAT at the same time of bid submission.*

## II. Price Proposal

- a. Only qualified Bidders whose technical proposals are compliant are allowed to have his price proposal opened on the price proposal opening date.
- b. For price quotation, Bidder ***shall*** fill ***in*** bid prices in Excel files of Price Schedules contained in the Bidding Documents in accordance with Price Quotation Instructions in Section C, Part 1 : Price Proposal, and submit one (1) original ***hard copy with the PDF and Excel files in USB flash drive*** to EGAT at the same time of bid submission.

VAT at the prevailing rate shall be filled automatically in the Summary of Bid Price of the price schedule in the Excel file subject to Article B-2. Bid Prices.

However, in case Bidder is a consortium formed of two or more companies, Bidder must also submit one (1) original hard copy ***with the PDF and Excel files*** of price schedules of the Work performed by each member of the consortium in addition to hard copies ***with the PDF and Excel files*** of the total bid price as specified above.

If any discrepancy between the bid prices of the Work performed by each member of the consortium and the bid prices of the Bidder occurs, the bid prices of the Bidder shall govern and the bid prices of the Work performed by each member of the consortium shall be adjusted accordingly.

In the event of discrepancy between the original hard copy ***and the PDF or Excel files*** submitted, the original hard copy shall govern.

- c. Bids shall be quoted for all items in each Price Schedule. Bidders are required to quote on all Price Schedules, and the bids will be considered on the combination of all Price Schedules.
- d. Any price discount to be offered shall be clearly stated in the Discount Form accompanied with the price proposal.

### **B-2. Bid Prices**

#### Currency

- a. Bid prices shall be expressed and payable in the currencies in which the bid prices have been stated.

The bid price shall be quoted in Thai baht, US dollar, euro, Japanese yen, renminbi (Chinese yuan), or in the Bidder's or manufacturer's home currency only if his currency trading is prevailed at the time of bidding in any international market other than in Bidder's or manufacturer's home country.

If the currencies quoted by the Bidder do not conform to the requirement set forth herein, EGAT reserves the right to convert the bid price to US dollars by

using the exchange rate on the Bloomberg screen which is announced at 10.00 a.m. (Bangkok Time) on the technical proposal opening date. Such converted bid price in US dollars shall be treated as the Bidder's proposed bid price. In such case the Contract Price for such portion under the Contract shall be made in US dollars.

Subject to the second paragraph of a. above, in case the Bidder expects to incur a portion of its expenditures in the performance of the Contract in more than one currency and wishes to be paid accordingly, the bid price shall be expressed in different currencies and the respective amount in each currency together making up the total price.

Local expenditures shall not be quoted in other currencies except in Thai Baht.

Price adjustments for construction and installation works are allowed in accordance with the conditions set forth under Article C-1. Price Schedule. All other prices shall be firm not subject to price adjustment.

#### Source of Supply and Service

Bid prices shall be quoted as follows :

##### 1. Prices for Equipment

###### Foreign Supply

Subject to Article B-2. a. above, bid prices for Equipment manufactured outside Thailand (imported Equipment) shall be firm CIF Thai Port basis and quoted in currencies specified above. Any import duty, excise tax (if any) and value added tax to be assessed by the Government of Thailand at the port of entry shall not be included in the quoted bid prices.

***Prices for the following Equipment manufactured outside Thailand which was imported before the technical proposal opening date shall be firm ex-works and quoted in Thai baht, provided that the Bidder shall submit any document(s) evidencing the importation date of such Equipment:***

***- Joint box for optical fiber cable***

###### Local Supply

Prices for Equipment manufactured in Thailand shall be firm ex-works prices and quoted in Thai Baht. Any import duty and taxes (value added tax included) to be assessed by the Government of Thailand at the port of

entry on imported raw materials or components shall be paid by the Contractor and included in these ex-works prices.

2. Prices for the Dismantled Equipment

Prices including value added tax for the dismantled Equipment to be purchased by the Bidder shall be as specified in the Price Schedule. In case the Bidder's proposed prices are different from the prices specified by EGAT, the Bidder's proposal shall fail to comply with the requirement under this Article.

3 Prices for Local Transportation, Construction and Installation Work as well as Prices for other Provisions of all Services

Prices for local transportation, construction, installation and civil work as well as prices for other provisions of all services, if any, shall exclude value added tax.

Price Schedule

- a. The Bidder shall enter a unit price, an amount, or a lump sum price, as required, for every item listed in the price schedules. If the unit price as entered does not conform to the amount entered for the same item, the unit price shall govern. If the sum of the amount entered for individual items does not conform to the total amount entered for these amounts under total bid prices, then the sum of the amount entered for the individual items shall govern.
- b. The Bidder shall also quote detailed breakdown price and give details of spare parts as well as optional items as required in the price schedules.
- c. Each unit price or lump sum quoted in the bid price schedules shall be the Bidder's price for performing that item of work including but not limited to all overhead, profit and transportation and expenses involved according to Article E-11. Import Duty and Taxes, Article E-12. Value Added Tax, Article E-13. Income and Other Taxes and Article E-14. Fees and Duties respectively.
- d. Except for foreign supply, VAT at the prevailing rate shall be filled automatically in the Summary of Bid Price of the price schedule in the Excel file. However, the Contract Price shall include VAT only for the portion of Work which is subject to VAT.

### **B-3. Bid Security**

The original of the bid submitted shall be accompanied with bid security in the form of a cash deposit, or a cashier cheque issued by a local bank, or a bank guarantee, or letter of guarantee issued only by a local bank, or a cashier cheque, or an acceptable financial institution in Thailand, or by a foreign bank counter-guaranteed by a local bank as primary obligor. In case of a cash deposit or a cashier cheque, only Thai baht can be made.

The bid security shall be in a form as per specimen attached or any other form with essential content in accordance with the specimen, and made payable to EGAT in the amount as specified in Data Sheet. Any bid not being accompanied with the bid security shall be rejected. The bid security shall remain in force up to and including ninety (90) Days after the expiry date of the bid validity.

The bid security shall be forfeited in favor of EGAT if:

- a. The Bidder withdraws his bid after the bids are opened; or
- b. The Bidder fails to adjust unrealistic prices according to Article B-12. Evaluation and Comparison of Bids; or
- c. The successful Bidder fails for any reason to execute the Contract or to furnish the performance security.

The Bidder may, upon EGAT's request to extend the bid security when it has expired, refuse to do so without forfeiting the bid security. A Bidder granting the request will be neither required nor permitted to modify his bids.

The bid security of unsuccessful Bidder(s) whose technical proposals were rejected will be returned after the opening of price proposals. The bid security of unsuccessful Bidder(s) whose technical proposals were accepted will be returned within thirty (30) Days following EGAT's acceptance of the successful Bidder.

The bid security of the successful Bidder will be returned upon execution of the Contract and after the performance security furnished has been accepted by EGAT.

### **B-4. Validity of Bids**

The validity of the bid shall be as specified in Data Sheet.

In the event EGAT requires the validity period to be extended, EGAT may in writing or by *letter submitted electronically or by electronic mail (E-mail)* so notify the Bidders at least fourteen (14) Days prior to the expiry date of the validity period, in which event any Bidder not agreeing to such request for

extension may withdraw his bid by so advising EGAT in writing or by *letter submitted electronically or by electronic mail (E-mail)* to the expiry date of the original validity period. If the advice of withdrawal is not received by EGAT prior to the said date, the extension shall be deemed to be accepted by the Bidder, and the Bidder shall be required to extend the effective period of the bid security accordingly.

**B-5. Delivery of Bids**

Where bids are submitted by mail, the hour and date of receipt of the bid will be taken as that certified by EGAT. For all bids delivered directly, a receipt will be furnished to the Bidder indicating the place, hour, and date of delivery. Late bids will be returned unopened.

**B-6. Withdrawal of Bids**

Bids may be withdrawn only on written request which are received by EGAT prior to the time fixed for the receipt of the bids. Negligence on the part of the Bidder in preparing his bid confers no right for the withdrawal of the bid after it has been opened. Whenever a bid has been withdrawn, it will be returned unopened to the Bidder.

**B-7. Interpretation of Bidding Documents before Bid Opening**

If a prospective Bidder is in doubt about the true meaning of any part of the Bidding Documents, the Bidder may submit to EGAT a written request for a reply or interpretation. Such request shall be submitted to EGAT at least thirty (30) Days prior to the date specified for technical proposal opening. An interpretation will be given in the form of a Supplemental Notice furnished to all prospective Bidders. Receipt of all Supplemental Notices shall be acknowledged by each prospective Bidder on the Proposal. Oral interpretation of the Bidding Documents will not be binding.

Should the prospective Bidder fail to submit their request for a reply or an interpretation within the time specified above, EGAT reserves the right not to respond to such request.

**B-8. Information to be Submitted with Bid**

Each Bidder shall submit with his technical proposal referred to as Envelope I the following documents, data and information in the English language in addition to any other information called for elsewhere in the Bidding Documents in order to enable EGAT to fully evaluate the Proposal of the Bidder:

- a. Sufficient references describing technical knowledge, and equipment, supply and construction experience of the Bidder, including transmission line projects similar to the Work required under this Invitation, to fulfill the requirements of the eligibility of Bidders. The information for transmission line projects previously performed or under execution by the Bidder shall clearly describe the nature and extent of the stated Work including design or supply of equipment or construction or the combination thereof, operating voltage, number of circuits, number of conductors per phase, total line length, total circuit distance, method of stringing of conductors of each phase, month and year of starting, completion and operation, quantity or magnitude of the work, contracted value in equivalent United States Dollars, site and owner.
- b. Sufficient references describing transmission line projects previously performed by the Bidder similar to the work required under this Invitation which demonstrated at least one year of successful operation. These shall include reference(s) in the electric utility industry, for projects completed, which can attest to the timely and efficient completion of equipment supply and construction activities. The references shall include the names of the companies, the names of company representatives, their titles, addresses, telephone and facsimile numbers for further communication.
- c. Sufficient references describing the technical knowledge and ability in, including facilities for designing, detailing, manufacturing, testing and delivering of the Equipment required and manufacturing capacity of the manufacturers. The references shall include at least a three-year record of the equipment supplied for similar projects of equal magnitude.
- d. If any subcontractor is proposed to fulfill the requirement, the Bidder shall indicate for which items as detailed in the Price Proposal he intends to subcontract his Work. The Bidder shall give the names and addresses of the proposed subcontractors and the Work to be performed by each. The qualifications and previous experience of each subcontractor shall be described. A letter from the subcontractor agreeing to cooperate with the Bidder to carry out the Work is also required.

Pursuant to Article E-7. Contractor's Employees, any local engineer(s) proposed for the supervision of installation shall be a professional engineer and receive a license from the Council of Engineers in Thailand, and a copy



of this license shall be submitted. Such engineer shall be a full-time employee having the scope of Work and responsibility in accordance with the Engineer Act, B.E. 2542 and the relevant ministerial regulations. Such engineer shall be present at the site of the Work during all normal working hours and shall have full authority to represent the Contractor in all matters concerning the progress of the Work.

- e. Copies of auditor certified balance sheets of the Bidder for the past three (3) consecutive years.
- f. An organization chart together with bio-data sheets with complete qualifications, experience and proficiency of the supervisory personnel the Bidder proposes to execute the Work with indication of those who are Thai and are non-Thai nationals. This chart shall be accompanied with a proposal showing the scheduled period of employment and a statement of the availability of the proposed employees for the Work.
- g. Proposed shop and construction detailing, drawing submission, manufacturing, testing, delivery and construction schedule showing the sequence of each activity from the start to the completion of the Work.
- h. A well-established Quality Assurance/Quality Control (QA/QC) program designed to ensure materials and equipment serviceability and successful construction of the transmission line. In the case of construction activity, the QA/QC program should concentrate on staged inspection and checking such that defects are located early enough to ensure that any remedial measures carried out do not require complete construction stoppages and rebuilds.
- i. Number of engineers, foremen, technicians and laborers to be employed for executing each feature of the Work.
- j. List of construction equipment the Bidder intends to use in the execution of the Work. The list shall include testing equipment, tools, instruments and machinery, including names, specifications and quantity presently owned by the Bidder and those the Bidder intends to lease or acquire for use on this Contract.
- k. Schedule of shipment of all local and imported Equipment to be supplied under this Contract including shipping point, quantity and estimated total value of each shipment.
- l. A statement of requirements of conductor, steel towers, hardware and line accessories, and any other Equipment (if any), specifying dates on which each Equipment will be required to be available from EGAT in Bangkok and/or its vicinity, and the quantities required on those dates if the conductor, steel

towers, hardware and line accessories, and other Equipment (if any) are specified to be furnished by EGAT under this Invitation for EGAT's information and consideration.

- m. Details of stringing procedures and stringing equipment demonstrating the Bidder's ability to meet all the requirements of the Bidding Documents.
- n. A statement of proposed minor deviations from the Specifications along with complete specifications and all necessary descriptive literature for any proposed alternative Equipment or procedure, as required under Article B-9. Deviations from Specifications.
- o. Detailed information on the proposed transmission line steel towers including:
  - (i) Name of manufacturer and country of origin.
  - (ii) Name of erection subcontractor and country of origin.
  - (iii) Complete design including design drawings for each type and height of tower body, complete series of leg extensions. Drawings shall show scaled line diagram of the tower completely dimensioned and proving compliance with all clearance requirements, all loadings and their manners of application including wind load on tower, total stresses in each member for each loading case and the critical case, size and type of steel for each member including member and sizes of bolts for each connection.
  - (iv) Estimates of the weights of each tower type and of each type and height of leg extension.
  - (v) A statement of the grade or grades of steel to be used if different from EGAT's design drawings and designating where each grade will be used in the structures. The statement of the grade of steel shall include the recognized standard specifications which apply to the steel.
  - (vi) Detailed information on facilities to be used for testing the towers.
- p. Detailed information on the proposed transmission line tower foundation construction including :
  - (i) Name of soil boring subcontractor.
  - (ii) Name of foundation subcontractor.
  - (iii) Complete design criteria including loads acting on foundation for each loading condition.

- (iv) Design drawings for each type of tower foundation showing detailed dimensions of tower foundation, details of placing and size of all reinforcing steel and details of placing and cut off elevation of piles for pile foundation.
- (v) Estimates of the volume of concrete and weight of reinforcing steel for each type of tower foundation.
- (vi) Proposed method of providing quality control of concrete work.
- (vii) Details of proposed stub angle setting template or frame.
- q. A statement of the type of piles intended to be used together with any pertinent additional information including general dimensions and proposed method of manufacturing, driving, splicing and anchorage to pile cap.
- r. Detailed information on the proposed conductor, overhead ground wire/shield wire, insulators, insulator assemblies, overhead ground wire assemblies/shield wire assemblies, vibration dampers, overhead ground wire with optical fiber/shield wire with optical fiber, fiber optic equipment, spacer-dampers, line accessories and grounding materials, if any of such equipment is required under this Invitation including :

For 115 kV and 230 kV Transmission Line

- (i) Name of manufacturers and countries of origin.
- (ii) Sufficient drawings, catalogs, leaflets, material specifications, and other identifying and descriptive literature to clearly demonstrate that the Equipment offered meet all the requirements of the Bidding Documents and the Specifications.
- (iii) Detailed information on facilities to be used for corona testing of spacer-dampers.
- (iv) Data from previous laboratory and/or field testing which will demonstrate the capability of the dampers and spacer-dampers and their components to limit aeolian vibration and subconductor oscillation to a safe level. This data shall include accelerated laboratory vibration tests with detailed information on the frequency, amplitude and number of cycles to failure or limits of tests.
- (v) Records of past successful supply of the same type of spacer-dampers used by other utilities including type, date of installation, quantity and line length, conductor data, average span, tension limits, etc. EGAT may reject new spacer-damper designs which have no supply record.

- (vi) Detailed information on the design, recommended locations and spacing of the vibration dampers for overhead ground wire and vibration dampers and/or spacer-dampers for conductor for various span lengths including total estimated quantity of the spacer-dampers for conductor to be used for this Invitation.
- (vii) Sufficient references describing at least three (3) consecutive years of successful operation/use of the insulators of the same ANSI class specified in this Invitation in similar transmission line project. The references shall clearly demonstrate name of the transmission line and its operating voltage; month and year of delivery completion and operation; quantity of operated insulators; and names of the utility, including the names of utility representatives, their titles, addresses, and telephone and facsimile numbers for further communication.
- (viii) Previous test reports of the insulators of the same ANSI class required in this Contract Documents demonstrating that the offered insulators meet or exceed the technical requirements of Specifications No.C-2 (Revision 6) and Specifications No. TL-01 : Additional Specification of Insulator Tests. The tests must be performed in accordance with ANSI C29.2 by the method of ANSI C29.1, which consist of :
  - 1. Design tests
  - 2. Quality conformance tests
  - 3. Steep front wave test
  - 4. Power arc test

The acceptance criteria for the tests shall be in accordance with the requirements specified in EGAT's Specifications attached to these Contract Documents. Moreover, the reports shall be of the tests carried out no longer than ten (10) years before the bid opening date.

Such previous test must be witnessed and the test report must be certified by a representative of an internationally-recognized testing laboratory, or inspection firm, or an institute, or a client inspector which is clearly not aligned with the manufacturer.

#### For 500 kV Transmission Line

- (i) Name of manufacturers and countries of origin.
- (ii) Sufficient drawings, catalogs, leaflets, material specifications, and other identifying and descriptive literature to clearly demonstrate that

the Equipment offered meet all the requirements of the Bidding documents and the Specifications.

- (iii) Sufficient reference describing the technical experience of the manufacturers in the design, manufacture and testing of same or similar type of insulators, hardware and line accessories including number of years of experience.
- (iv) Records of past successful supply, of not less than 5 years of the same or equivalent type of insulators and their use in extra-high voltage projects including the supplied quantity.
- (v) Previous test reports of the same ANSI class 52-8 and 52-11 suspension insulators demonstrating that the insulators offered meet or exceed the technical requirements of paragraph C [except subparagraph (3)] of Article D-7, Specifications No. L-500 kV: Construction of 500 kV Transmission Lines. The tests shall be performed in accordance with ANSI C29.2 by the method of ANSI C29.1, which consist of:
  - 1. Design tests
  - 2. Quality conformance tests
  - 3. Power arc test
  - 4. Steep front wave test

The acceptance criteria for all tests shall be in accordance with the requirements specified in EGAT's specifications.

Such previous tests shall have been witnessed and the test report certified by a representative of an internationally recognized testing laboratory or inspection firm, or an institute or client inspector who is clearly not aligned with the manufacturer. Bidders who fail to submit the required insulator test reports may be rejected.

- (vi) Records of past successful supply, of not less than 5 years of the same or similar type of hardware and line accessories and their use in extra-high voltage projects containing at least 2 extra-high voltage lines of four bundled conductor system including the supplied quantity.
- (vii) Previous test reports of the same or equivalent type of conductor and shield wire hardware and line accessories to demonstrate that the Equipment offered meets all the requirements of the Bidding Documents.

- (viii) Detailed information of the test station describing the technical experience in testing of complete conductor insulator and hardware assemblies including number of years of experience in conducting electrical performance tests and also including experience in conducting tests at the 500 kV voltage level.
- (ix) Records of past successful supply of the same type of spacer-dampers used by other utilities including type, date of installation, quantity and line length, conductor data, average span, tension limits, etc. EGAT may reject new spacer-damper design which has no supply record.
- (x) Detailed information on the design, recommended locations and spacing of the vibration dampers for shield wire and vibration dampers and/or spacer-dampers for conductor for various span lengths including total estimated quantity of the spacer-dampers for conductor to be used for this Invitation.
- (xi) Detailed information on facilities to be used for corona testing of spacer-dampers.
- (xii) Sufficient references demonstrating the following record for the following equipment in similar transmission line project:
  - a) successful operation/use of the insulators of the same ANSI class as specified in this Invitation for at least three (3) consecutive years.
  - b) successful operation/use of conductor hardware assemblies and line accessories, except spacers and spacer dampers, of the same or similar type as specified in this Invitation for at least three (3) consecutive years.
  - c) successful operation/use of spacers and spacer dampers of the same or similar type as specified in this Invitation for at least five (5) consecutive years.

These references shall clearly demonstrate name of the transmission line and its operating voltage; month and year of delivery completion and operation; quantity of operated insulators; and names of the utility, including the names of utility representatives, their titles, addresses, and telephone and facsimile numbers for further communication.

- s. In case the locally manufactured Equipment is proposed, the sufficient documentary evidence, if any, showing that the manufacturers have been acknowledged for producing standard product by the Thai Industrial Standard Institute (TISI), Ministry of Industry, or registered with TISI or ISO 9000

certified by the National Accreditation Council of Thailand (NAC), or obtained the privilege from the Board of Investment or accepted by EGAT for manufacture of such Equipment is required to be submitted with the Bid.

- t. Where Proposal Data Forms are provided, the Bidder shall enter all information as directed.
- u. Where the Specifications provided for submission of a sample or samples, the Bidder shall submit same together with his bid.
- v. Joint Venture/Consortium Agreement with a statement that each member of a joint venture/consortium will be jointly and severally responsible and liable for the complete execution of the work (in case the Bidder is a joint venture or consortium).
- w. 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.

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

Should the Bidder fail to submit any of the document described above and neglect to submit the same to EGAT within the time as specified by EGAT, such failure shall be sufficient reason for rejection of his bid.

Verbal statements made by the Bidder at any time regarding quality, quantity, or arrangement of Equipment will not be considered.

If alternate Equipment is indicated in the bid, it shall be understood that EGAT will have the option of selecting any one of the alternates so indicated and such selection shall not be a cause for extra compensation or extension of time.

In case the Bidder proposes alternate Equipment, with the condition to supply any one of the alternates so indicated at his option, such bid will be considered conditional and may be considered sufficient reasons for rejection.

**B-9. Deviations from Specifications**

Unless otherwise provided in the Specifications, the quality of Equipment and workmanship shall comply in all respects with the Standards required under the bidding documents.

If the Bidder proposes any minor deviations from the specifications, he shall submit a statement of each proposed deviation referenced to the particular Article of these specifications, details on the design drawings or article, paragraph and section of referenced standards or specifications. Full details of all minor deviations together with confirmation shall be submitted with the bid in a form provided in Section C. The Bidder shall submit, with his bid, copies of the standards or specifications proposed for his deviations. In case there is no statement in the form provided in Section C in the Bidder's proposal on the proposed deviations, the bid shall be regarded by EGAT as conforming in all respects to the terms and conditions and Specifications as stated in the bidding documents at no additional cost to the bid price.

Notwithstanding the foregoing, it is at EGAT's sole discretion in determining whether any of such proposed deviations is acceptable and in determining whether it is minor or major deviation.

**B-10. Rejection of Bids**

EGAT reserves the right not to accept the lowest evaluated bid.

Bids shall be strictly based on the Specifications and terms and conditions in the Bidding Documents. Should any bid fail to comply with the terms and conditions stipulated in these Bidding Documents or be incomplete, conditional or obscure, or contain additions not called for, or irregularities of any kind, it will be liable to rejection.

EGAT also reserves the right to reject any or all bids submitted without giving reasons or to reject the bid from any Bidder who fails to satisfy EGAT that :

- a. The bid complies with the terms and conditions stipulated in these bidding documents without any non-compliance which is deemed substantial and advantageous over other Bidders.



- b. The Bidder has adequate financial resources to execute and complete the Work.
- c. The Bidder's personnel proposed for the Work are sufficiently experienced, competent and adequate in number to efficiently execute the Work.
- d. The construction equipment, tools, instruments and machinery which the Bidder proposes to employ on the Work are adequate and efficient.
- e. The Bidder's design, manufacture and construction schedule are realistic and satisfactory to EGAT and conform to the requirements of the Bidding Documents.
- f. Price quoted for each item shall represent a realistic cost estimate for performing the Work specified in each item.

#### **B-11. Completion Time**

Completion time required is indicated in the Proposal section of the Bidding Documents and should be carefully observed. Any bid indicating a completion date later than the date specified in the Bidding Documents shall be rejected as non-responsive. No credit will be given in evaluation to Bidder who proposes earlier completion time.

#### **B-12. Evaluation and Comparison of Bids**

##### **I. Technical Evaluation and Comparison**

The technical proposals will be opened and reviewed to determine their acceptability and compliance to the Specifications. The evaluation of the technical proposals shall be as follows :-

1. Technical proposals which do not meet the restricted requirements under Article A-3. Eligibility of Bidders: General Requirements: I and A-4. Eligibility of Bidders: Technical Requirements: I or those with major deviations from EGAT's requirements on standard specifications, and the unacceptable and non-compliant bids shall be rejected.
2. Technical proposals which do not meet the requirements under Article A-3. Eligibility of Bidders: General Requirements: II and A-4. Eligibility of Bidders: Technical Requirements: II or those with minor deviations from EGAT's standard specifications may be rejected.

However, EGAT will inform the Bidders of their noncompliance with a written notice. If the Bidders fail to adjust their proposals or to change suppliers or to withdraw commercial deviations as advised by EGAT, their proposals shall be rejected.

The corresponding price proposals will be retained unopened.

3. Letters will be sent to the Bidders whose technical proposals are accepted, informing them of the opening date of the price proposals.
4. Letters will also be sent to the Bidders whose bids have been rejected, and on receipt of such notice, the Bidders may collect from EGAT the corresponding unopened price proposals, if request is made for return at EGAT's head office within thirty (30) Days following the date set for opening of the price proposals. Following this time interval any price proposals of rejected bids retained by EGAT shall be destroyed unread.

## II. Price Evaluation and Comparison

For the evaluation and comparison of bids, bid prices will be converted into Thai Baht at the selling exchange rates, published by the Bank of Thailand, between Baht and other currencies on the technical proposal opening date.

Bids shall be compared on the basis of combination of bid prices for both supply and construction including all services in the Scope of Work.

Prices offered for optional items will not be taken into consideration; however, Bidders shall also quote the prices thereof, if required.

In respect of the supply of Equipment, the price to be used for comparison purpose shall be as follows:

1. CIF Bangkok price including import duty at the rate prevailing on the technical proposal opening date, associated taxes (if any) and value added tax to be assessed by the Thai Government at the port of entry for imported Equipment. Such import duty, associated taxes (if any) and value added tax will be calculated by EGAT.

The rate of import duty to be used for price comparison shall be as follows:

- a) In case any imported Equipment and spare part is proposed from one (1) country of origin for the same item:
  - Country of Origin Under Free Trade Agreement (FTA) – using lower comparing rate between the FTA rate and the normal rate published in the Customs Tariff Decree;
  - Country of Origin Under Non FTA – using a normal rate published in the Customs Tariff Decree.
- b) In case any imported Equipment and spare part is proposed from different countries of origin for the same item, a normal rate published

in the Customs Tariff Decree for such Equipment and spare part will be used for price comparison.

2. Ex-works price including value added tax for locally manufactured Equipment.

For local transportation, construction and installation Work as well as on other provisions of all services under the Contract, the price to be used for comparison purpose shall include value added tax (VAT).

If the quoted price for any items are unrealistic, EGAT reserves the following rights:

- 1) to adjust such prices for evaluation purpose; or
- 2) to remove those items from the Scope of Work; or
- 3) to reject such bid and to forfeit a bid security in case the Bidder disagrees with EGAT on points 1 and 2 above even though he is the lowest evaluated Bidder.

#### **B-13. Acceptance of Bids**

EGAT will not be bound to accept the bid with the lowest indicated cost. EGAT reserves the right to accept the bid which in its judgment is the lowest evaluated bid. In making its selection, EGAT will take into consideration the conformity of the bid to the requirements of the Bidding Documents and Specifications, guaranteed delivery and construction completion time, the suitability for the purpose intended. EGAT will also take into consideration whether the Bidder's experience, organization, facilities and financial resources will assure the successful carrying out of the Work under the Contract within the time specified.

#### **B-14. Appeal**

Disqualified or unsuccessful Bidders who see that their disqualification or failure are due to EGAT's non-compliance with EGAT's procurement regulations may appeal to EGAT within fifteen (15) Days from the date of receipt or announcement, whichever comes first, of EGAT's final evaluation result. An appeal shall be made in writing and clearly state the cause of appeal and argument with referred facts or regulations and related documents. Appealing does not constitute a ground for suspending the ongoing procurement process unless EGAT's Governor agrees otherwise.

The Contract or Purchase Order shall not be executed until the period of appeal has ended and there is no appeal. In the event there is an appeal during such period, the Contract or Purchase Order shall not be executed unless EGAT's Governor concurs.

Decision of EGAT's Governor is final and conclusive.

#### **B-15. Award of Contract**

The Contract will be awarded as soon as practicable after opening of the price proposals, to the Bidder with the lowest evaluated bid. EGAT reserves the right to award the Contract on the basis of standards and specifications as proposed by the Bidder, if in the opinion of EGAT, they are considered acceptable.

At the time of execution of the Contract, the successful Bidder shall furnish the performance security in accordance with the conditions of Contract in the specimen of performance security provided in the bidding documents.

Failure to comply with the condition as expressed in the specimen of performance security will lead to withdrawal of award and cancellation of Contract, and in this respect EGAT reserves the right to award the Contract to the Bidder with the next lowest evaluated substantially responsive bid and the Bidder who defaults shall have his bid security forfeited in favor of EGAT.

After EGAT notifies the successful Bidder that his bid has been accepted, EGAT will send the Bidder the Contract Documents incorporating all agreements between the parties not later than ninety (90) Days after confirmation of Letter of Award of Contract.

Promptly but not later than fifteen (15) Days after receipt of the Contract, the successful Bidder shall sign and date the Contract and return it to EGAT.

EGAT will notify each unsuccessful Bidder its decision after award of Contract.

#### **B-16. Bidder's Responsibility**

The Bidder shall be deemed to have carefully examined all of the terms, conditions and Specifications of this Invitation to Bid, and also to have fully informed himself as to all conditions, local or otherwise, affecting the carrying out of the Work of the Contract, and to have formulated an estimate of the facilities available and needed.

The Bidder shall also be liable to any rules and regulations as well as Acts enforced in the Kingdom of Thailand. Failure to do so will be at the Bidder's risk.

The Bidder shall also be deemed to have inspected and examined the sites, their surroundings, and all relevant information available including that pertaining to subsurface conditions, hydrologic and climatic conditions and the means of access.

**B-17. Supplemental Notices**

Supplemental Notices to the Bidding Documents may be issued prior to the date of opening of technical proposals to clarify the Bidding Documents or to reflect modifications in the design or Contract terms. Each supplemental notice issued will be distributed to each person or organization to whom the Bidding Documents have been issued. The recipient shall acknowledge receipt of each supplemental notice by signing and returning in a reasonable time the receipt form distributed with the supplemental notice. All supplemental notices issued shall become a part of the Contract Documents.

**B-18. Cost of Bidding**

Bidders will not be reimbursed for any expenses they may incur in preparing and submitting their bids.

**B-19. Cancellation of Bid**

EGAT reserves the right not to accept any quantity or item or schedule or package, or to cancel the bid without purchasing any item. Bidders shall not be entitled to claim EGAT for any losses and/or damages in this connection. EGAT also reserves the right to cancel the bid should there be any reasonable grounds that bidder is not in good faith in submitting bid such as submitting false documents.

In case of bid cancellation, EGAT will not be responsible for any losses and/or damages and will not refund payment of Bidding Documents.

## **SPECIMEN OF BID SECURITY**

Whereas..... (hereinafter called "the Bidder") has submitted his bid dated ..... for ..... (hereinafter called "the Bid") under Invitation to Bid No ..... KNOW ALL MEN by these presents that We ..... of ..... having our registered office at ..... (hereinafter called "the Guarantor") are bound unto the Electricity Generating Authority of Thailand (hereinafter called "EGAT") in the sum of ..... (in words : ..... ) for which payment well and truly to be made to EGAT, the Guarantor binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank this .....(date)..... day of .....(month)....., 20 ....(year).....

THE CONDITIONS of this obligation are :

1. If the Bidder withdraws his bid during the period of bid validity specified in the Bidding Documents; or
2. If the Bidder fails or refuses to adjust unrealistic prices according to Article B-12. Evaluation and Comparison of Bids; or
3. If the Bidder, having been notified of the acceptance of his bid by EGAT during the period of bid validity;
  - (a) fails or refuses to execute the Contract, if required; or
  - (b) fails or refuses to furnish the Performance Security, in accordance with the Instructions to Bidders;

We, the Guarantor, unconditionally undertake to pay to EGAT as the primary obligor, up to the above amount upon receipt of its first written demand, without EGAT having to substantiate its demand.

This guarantee will remain in force up to and including ninety (90) Days after the expiry date of the bid validity.

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(Signature of the Bank)

**SECTION C**  
**PROPOSAL**

## **PROPOSAL**

### **C-1. Price Schedule**

The undersigned Bidder, having carefully examined the Bidding Documents in their entirety, hereby offers and proposes to design and furnish all Equipment and to complete all the testing, construction and installation services as described in the Bidding Documents and applicable Specifications for the prices as stated in the attached schedules and subject to the following conditions :

- a. The item price as specified in the Price Schedule for Construction and Installation Work will be adjusted for both increasing or decreasing of the cost incurred during the completion date originally specified in the Contract and during the extension of time granted by EGAT in accordance with Article E-31. Extension of Time (if any). In case the Contractor, by his own fault, is unable to complete the work within the completion date originally specified in the Contract or within the extension of time granted by EGAT, the escalation factor (K) in the month of completion date or in the final month of work performed, of whichever is less, will be used. Price adjustment will be made on the following conditions :
  1. The adjustment of item price will be made only after the calculation which reveals that the escalation factor (K) of the respective item price in the month of work performed is changed (increase or decrease) more than four (4) per cent comparing to that on the date which is 28 Days prior to the bid opening date.
  2. For price increasing, the Contractor shall submit the request within ninety (90) Days after EGAT's issuance of Provisional Acceptance Certificate. Failure to do so means the Contractor waives his right for price adjustment.
  3. For price decreasing, EGAT shall promptly submit the request for reimbursement and make deduction from the next payment or make deduction from the performance security.
  4. In calculation of price adjustment, the following formula shall be applied :

$$P = (P_o) \times (K)$$

Where P = escalated price allowed

P<sub>o</sub> = item price as bid

K = Escalation Factor minus 0.04 for price increasing (when K is more than 1.04)

K = Escalation factor plus 0.04 for price decreasing (when K is less than 0.96)



No escalation is allowed for the value of K from 0.96 to 1.04.

All price index shall be as fixed by the Ministry of Commerce.

5. Escalation factor for the item price of the Work shall be computed as herebelow described :

Formula 1.  $K = 0.60 + 0.25 I_t/I_o + 0.15 F_t/F_o$

This formula will be applied for the following construction and installation work :

- (i) Preliminary work except boundary posts
- (ii) Towers
- (iii) Insulator string, overhead ground wire (including shield wire and overhead ground wire with optical fiber) assemblies
- (iv) Conductor, overhead ground wire (including shield wire and overhead ground wire with optical fiber) stringing
- (v) Line accessories for conductor, overhead ground wire (including shield wire and overhead ground wire with optical fiber)
- (vi) Grounding materials

Formula 2.  $K = 0.35 + 0.20 I_t/I_o + 0.15 F_t/F_o + 0.20 C_t/C_o + 0.10 S_t/S_o$

This formula will be applied for the construction and installation work of tower foundations and boundary posts.

Where :

K	=	Escalation Factor
F <sub>t</sub>	=	Price index of high speed diesel fuel in the month of work performed.
F <sub>o</sub>	=	Price index of high speed diesel fuel on the date which is 28 Days prior to the bid opening date
C <sub>t</sub>	=	Price index of cement in the month of work performed.
C <sub>o</sub>	=	Price index of cement on the date which is 28 Days prior to the bid opening date
S <sub>t</sub>	=	Price index of steel reinforcement bars in the month of work performed.

$S_o$	=	Price index of steel reinforcement bars on the date which is 28 Days prior to the bid opening date
$I_t$	=	Consumer price index for Thailand in the month of work performed
$I_o$	=	Consumer price index for Thailand on the date which is 28 Days prior to the bid opening date

6. In making calculation for price adjustment in every step, only three (3) decimal places without rounding off of the value obtained from each calculated operation of any two values shall be used for the next calculation. The calculation of each relative value (ratio of price index) shall be performed prior to another calculation.
- b. All calculation and payments for price adjustment for the Contracts with the amount exceeding fifty (50) million Baht shall be approved by the Bureau of the Budget, while those for the Contract with the amount equal to but not exceeding fifty (50) million Baht shall be approved by EGAT. The corrections/decision made by the Bureau of the Budget shall be deemed final. The Bidder may contact the Bureau of the Budget for more information.

- IMPORTANT** : 1. Subject to Article E-22. Variations in Quantities and Article E-23. Changes and Extra or Omitted Work, the quantity listed in the Price Schedule represents the estimated quantity for bidding purposes only. The exact quantity shall be adjusted after check survey, staking and sub-soil test etc. have been performed by the Contractor per Article F-6. Revision of Price Schedule.
2. Cost of insurance in accordance with Article E-9. Insurance, shall be spread over the various items proposed.
  3. Cost of furnishing the performance security in accordance with Article E-15. Performance Security shall be spread over the various items proposed.
  4. Cost of office and other facilities, except motor vehicles of which the cost shall be quoted in Price Schedule, to be provided by the Contractor for the use of EGAT in accordance with Article G-6. Housing and Other Facilities shall be spread over the various items proposed.
  5. All materials, design details, manufacturing and tests shall conform to Specifications.
  6. Cost of all tests, test samples and test report which are not listed in Price Schedule but required by Specifications and Contract Documents shall be included in the prices of Equipment.
  7. Bidder is required to quote complete items of either porcelain or toughened glass insulator. In case porcelain insulator is proposed, the quantity of each color shall be specified.

**C-2. Guaranteed Time of Completion**

Completion dates for delivery of Equipment and for construction of the transmission line shall be as indicated under “Completion Date Required by EGAT” in the tabulation below. The undersigned Bidder hereby guarantees to perform and complete such delivery of Equipment and construction of the transmission line within the dates as indicated under “Completion Date Guaranteed by Bidder” in the tabulation.

<u>Schedule</u>	<u>Completion Date Required by EGAT</u>	<u>Completion Date Guaranteed by Bidder</u>
<b><u>Schedule 1</u></b> <b>(except 1N and 1O)</b>		
Construction completion of Supply and Construction of Transmission Line 500 kV Nan - Den Chai (From KM. 63 - Den Chai)	Within 26 Months after confirmation of Letter of Award of Contract	..... ..... .....
<b><u>Schedule 2</u></b>		
Construction completion of Supply and Construction of Transmission Line Sectionalizing of 500 kV Mae Moh 3 – Tha Tako (Circuit No.1 and Circuit No.4) to Den Chai Substation	Within 26 Months after confirmation of Letter of Award of Contract	..... ..... .....
<b><u>Schedule 3</u></b> <b>(except 3Z)</b>		
Construction completion of Supply and Construction of Transmission Line Sectionalizing of 500 kV Mae Moh 3 – Tha Tako (Circuit No.2 and Circuit No.3) to Den Chai Substation	Within 26 Months after confirmation of Letter of Award of Contract	..... ..... .....

**C-3. Bid Security**

Bid security in the amount of ..... has been deposited with EGAT.

**C-4. Supplemental Notices**

The undersigned Bidder certifies that the following Supplemental Notices have been received for the Bidding Documents:

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Proposal Submission Date \_\_\_\_\_ day of \_\_\_\_\_ A.D. \_\_\_\_\_

Firm's Name : \_\_\_\_\_

By : \_\_\_\_\_

Title : \_\_\_\_\_

Firm's Address : \_\_\_\_\_

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Witness

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**PART 1 : PRICE SCHEDULE**  
**PRICE QUOTATION INSTRUCTIONS**

This part of the Bidding Document comprises :

1. Summary of Bid Price (if any)
2. Total Price for each Transmission Line
3. Price Schedules

Cost of Supply of Equipment comprises Foreign Portion and Local Portion. For Foreign Portion, the Bidders are allowed to quote price in only four (4) different currencies. For Local Portion for Supply of Equipment, as well as Cost of Transportation, Construction and Installation, default currency is Baht (THB).

Bidder shall fill in the price schedules in the Excel file(s), item by item. The total prices for each schedule, Total Price for each Transmission Line and Summary of Bid Price will be automatically calculated.

Filling-in the data shall be in accordance with the following instructions :

1. Bidder shall fill in all data required in blue cells of the price schedules - Currency and Unit Price.
2. For local portion, the default is THB.
3. For Foreign portion, Bidder shall fill a currency code in a column "Currency"
4. For tap sheet BREAKDOWN such as BREAKDOWN OF SCHEDULE 1H, Bidder shall fill in all data required for Item No., Description, Estimated Qty, Unit Price. Amount Price for each item will be calculated automatically.

Remarks: Price Schedules are created in Microsoft Office Excel 2007.

INVITATION TO BID NO. NPUP-L-04

SUMMARY OF BID PRICE

SUPPLY AND CONSTRUCTION OF TRANSMISSION LINES 500 KV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI) AND SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO TO DEN CHAI SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

No.	Description	Currency	Supply of Equipment		Foreign Currency ( excluding VAT ) Amount	Local Currency ( excluding VAT ) Baht Amount	Local Transportation ( excluding VAT ) Baht Amount	Local Transportation, Construction and Installation ( excluding VAT ) Baht Amount	Purchase Price Offered for Dismantled Equipment ( including VAT ) Baht Amount
			Foreign Supply	Local Supply					
			CIF Thai Port	Ex-works Price ( excluding VAT ) Baht					
			Amount	Amount					
1	500 KV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI)								
2	SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO CCT. NO.1 AND CCT. NO.4 TO DEN CHAI SUBSTATION								
3	SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO CCT. NO.2 AND CCT. NO.3 TO DEN CHAI SUBSTATION								
									-1,471,240.00
BID PRICE				Baht		Baht	Baht	Baht	-1,471,240.00
VAT				Baht		Baht	Baht	Baht	
SUMMARY OF BID PRICE				Baht		Baht	Baht	Baht	-1,471,240.00

INVITATION TO BID NO. NPUP-L-04  
TOTAL PRICE FOR SCHEDULE NO. 1  
500 KV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI)  
Line Length 63.6 KM

SUPPLY AND CONSTRUCTION OF TRANSMISSION LINE 500 KV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI)  
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment	Supply of Equipment	Foreign Currency	Local Currency	Local Transportation	Local Transportation, Construction and Installation	Purchase Price Offered for Dismantled Equipment
		Foreign Supply	Local Supply					
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht					
		Amount	Amount					
1A : PRELIMINARY WORK								
1B : TOWER FOUNDATIONS								
1C : TOWERS								
1D : INSULATOR STRING AND OVERHEAD GROUND WIRE ASSEMBLIES								
1E : CONDUCTOR AND OVERHEAD GROUND WIRE								

Description	Currency	Supply of Equipment	Supply of Equipment	Foreign Currency	Local Currency	Local Transportation	Local Transportation, Construction and Installation	Purchase Price Offered for Dismantled Equipment
		Foreign Supply	Local Supply					
		CIF Thai Port	Ex-works Price ( excluding VAT )					
		Baht	Baht					
		Amount	Amount	Amount	Amount	Amount	Amount	Amount
1F : LINE ACCESSORIES								
1G : GROUNDING MATERIALS								
1H : OPTICAL FIBER AND LINE ACCESSORIES								
1N : TEST OF EQUIPMENT								
1O : SUPPLY OF SERVICE OF VEHICLES								
TOTAL PRICE			Baht		Baht	Baht	Baht	Baht
							Baht	



**INVITATION TO BID NO. NPUP-L-04**

**SCHEDULE NO. 1**

**1A : PRELIMINARY WORK**

**IMPORTANT :**

1. In case horizontal distance of line route is changed, the lump sum prices shall be adjusted accordingly.
2. The entire tree stump and root ball of eucalyptus, sugar cane and bamboo shall be completely excavated from the ground.

Item No.	Description	Estimated Qty.	Unit	Local Transportation, Construction and Installation ( excluding VAT ) Baht	
				Unit Price	Amount
1A1	Check survey and staking of tower location (approximately 63.6 km in transmission line distance)	lump sum	each		
1A2	Clearing right-of-way of 30 meters in width on each side of the center line of the transmission line (approximately 63.6 km in transmission line distance)	lump sum	each		
1A3	Sub-soil tests and preliminary measurement of ground resistance and earth resistivity at the depth and locations as directed by EGAT (to be performed at the depth and locations as directed by EGAT)				
1A3.1	Light ram sound tests with hand auger and preliminary measurement of ground resistance and earth resistivity from ground surface to 5 meters in depth	91	bore		

Item No.	Description	Estimated Qty.	Unit	Local Transportation, Construction and Installation ( excluding VAT ) Baht	
				Unit Price	Amount
1A3.2	Standard penetration tests and preliminary measurement of ground resistance and earth resistivity at the depth and locations as directed by EGAT (Approximately 64 bores)	640	m		
1A4	Boundary post along boundary line of right-of-way	310	post		
Total Price for 1A				Baht	

# **1B : TOWER FOUNDATIONS**

## **IMPORTANT :**

1. Pedestal height for all tower foundations shall be 1.0 meter, except as directed by EGAT.
2. The quoted price for additional reinforced concrete work including forms shall be consistent with the price quoted for tower foundation work. Moreover, the payment shall be made only for additional reinforced concrete work caused by modification of foundation design or additional work directed by EGAT.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1B1	Foundation for tower type DQV3									
1B1.1	Stub angle (500-4x1272 DQV3) and pad foundation type CV	79	tower		XXXXXX	XXXXXX				
1B1.2	Stub angle (500-4x1272 DQV3) and pad foundation type CIV	16	tower		XXXXXX	XXXXXX				
1B1.3	Stub angle (500-4x1272 DQV3) and pad foundation type CIII	5	tower		XXXXXX	XXXXXX				
1B1.4	Stub angle (500-4x1272 DQV3) and pad foundation type CS	5	tower		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1B2	Foundation for tower type DQV9									
1B2.1	Stub angle (500-4x1272 DQV9) and pad foundation type CV	8	tower		XXXXXX	XXXXXX				
1B2.2	Stub angle (500-4x1272 DQV9) and pad foundation type CIV	1	tower		XXXXXX	XXXXXX				
1B2.3	Stub angle (500-4x1272 DQV9) and pad foundation type CIII	1	tower		XXXXXX	XXXXXX				
1B2.4	Stub angle (500-4x1272 DQV9) and pad foundation type CS	1	tower		XXXXXX	XXXXXX				
1B3	Foundation for tower type DQT20									
1B3.1	Stub angle (500-4x1272 DQT20) and pad foundation type CV	9	tower		XXXXXX	XXXXXX				
1B3.2	Stub angle (500-4x1272 DQT20) and pad foundation type CIV	2	tower		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1B3.3	Stub angle (500-4x1272 DQT20) and pad foundation type CIII	1	tower		XXXXXX	XXXXXX				
1B3.4	Stub angle (500-4x1272 DQT20) and pad foundation type CS	1	tower		XXXXXX	XXXXXX				
1B4	Foundation for tower type DQT40									
1B4.1	Stub angle (500-4x1272 DQT40) and pad foundation type CV	7	tower		XXXXXX	XXXXXX				
1B4.2	Stub angle (500-4x1272 DQT40) and pad foundation type CIV	1	tower		XXXXXX	XXXXXX				
1B4.3	Stub angle (500-4x1272 DQT40) and pad foundation type CIII	1	tower		XXXXXX	XXXXXX				
1B4.4	Stub angle (500-4x1272 DQT40) and pad foundation type CS	1	tower		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1B5	Foundation for tower type DQT60									
1B5.1	Stub angle (500-4x1272 DQT60) and pad foundation type CV	5	tower		XXXXX	XXXXX				
1B5.2	Stub angle (500-4x1272 DQT60) and pad foundation type CIV	2	tower		XXXXX	XXXXX				
1B5.3	Stub angle (500-4x1272 DQT60) and pad foundation type CIII	1	tower		XXXXX	XXXXX				
1B5.4	Stub angle (500-4x1272 DQT60) and pad foundation type CS	1	tower		XXXXX	XXXXX				
1B6	Foundation for tower type DQT90									
1B6.1	Stub angle (500-4x1272 DQT90) and pad foundation type CV	1	tower		XXXXX	XXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1B7	Foundation for tower type DQTR									
1B7.1	Stub angle (500-4x1272 DQTR) and pad foundation type CV	3	tower		XXXXXX	XXXXXX				
1B7.2	Stub angle (500-4x1272 DQTR) and pad foundation type CIV	1	tower		XXXXXX	XXXXXX				
1B7.3	Stub angle (500-4x1272 DQTR) and pad foundation type CIII	1	tower		XXXXXX	XXXXXX				
1B7.4	Stub angle (500-4x1272 DQTR) and pad foundation type CS	1	tower		XXXXXX	XXXXXX				
Total Price for 1B							Baht		Baht	

## 1C : TOWERS

### IMPORTANT :

1. The quoted price for additional galvanized steel shall be consistent with the prices quoted for steel towers. Payment for additional galvanized steel shall be made in accordance with the terms stipulated in Article F-11. Basis of Payment.
2. In addition to Specifications No.L-500 kV, Article A-5. Fabrication, item h. Markings, all individual pieces shall also be marked with the word "ฉฟผ" together with the designations shown on detailed drawings.
3. Attachment devices as shackles or others for assemblies of Conductor, shield wire and OPGW shall be supplied with towers.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1C1	Tower type DQV3									
1C1.1	Basic body (500-4x1272 DQV3)	105	body		XXXXXX	XXXXXX				
1C1.2	Body extension 7.5 m (500-4x1272 DQV3)	56	body		XXXXXX	XXXXXX				
1C1.3	Leg extension 1.5 m (500-4x1272 DQV3)	4	leg		XXXXXX	XXXXXX				
1C1.4	Leg extension 3.0 m (500-4x1272 DQV3)	8	leg		XXXXXX	XXXXXX				
1C1.5	Leg extension 4.5 m (500-4x1272 DQV3)	12	leg		XXXXXX	XXXXXX				
1C1.6	Leg extension 6.0 m (500-4x1272 DQV3)	12	leg		XXXXXX	XXXXXX				
1C1.7	Leg extension 7.5 m (500-4x1272 DQV3)	56	leg		XXXXXX	XXXXXX				



Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1C1.8	Leg extension 9.0 m (500-4x1272 DQV3)	40	leg		XXXXXX	XXXXXX				
1C1.9	Leg extension 10.5 m (500-4x1272 DQV3)	288	leg		XXXXXX	XXXXXX				
1C2	Tower type DQV9									
1C2.1	Basic body with 0°- 3° arm (500-4x1272 DQV9(3))	11	body		XXXXXX	XXXXXX				
1C2.2	Body extension 7.5 m (500-4x1272 DQV9)	1	body		XXXXXX	XXXXXX				
1C2.3	Body extension 15.0 m (500-4x1272 DQV9)	5	body		XXXXXX	XXXXXX				
1C2.4	Leg extension 1.5 m (500-4x1272 DQV9)	8	leg		XXXXXX	XXXXXX				
1C2.5	Leg extension 3.0 m (500-4x1272 DQV9)	4	leg		XXXXXX	XXXXXX				
1C2.6	Leg extension 4.5 m (500-4x1272 DQV9)	4	leg		XXXXXX	XXXXXX				
1C2.7	Leg extension 6.0 m (500-4x1272 DQV9)	4	leg		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1C2.8	Leg extension 7.5 m (500-4x1272 DQV9)	8	leg		XXXXXX	XXXXXX				
1C2.9	Leg extension 9.0 m (500-4x1272 DQV9)	4	leg		XXXXXX	XXXXXX				
1C2.10	Leg extension 10.5 m (500-4x1272 DQV9)	12	leg		XXXXXX	XXXXXX				
1C3	Tower type DQT20									
1C3.1	Basic body (500-4x1272 DQT20)	13	body		XXXXXX	XXXXXX				
1C3.2	Body extension 7.5 m (500-4x1272 DQT20)	3	body		XXXXXX	XXXXXX				
1C3.3	Leg extension 1.5 m (500-4x1272 DQT20)	4	leg		XXXXXX	XXXXXX				
1C3.4	Leg extension 3.0 m (500-4x1272 DQT20)	8	leg		XXXXXX	XXXXXX				
1C3.5	Leg extension 4.5 m (500-4x1272 DQT20)	8	leg		XXXXXX	XXXXXX				
1C3.6	Leg extension 6.0 m (500-4x1272 DQT20)	4	leg		XXXXXX	XXXXXX				
1C3.7	Leg extension 7.5 m (500-4x1272 DQT20)	4	leg		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1C3.8	Leg extension 9.0 m (500-4x1272 DQT20)	8	leg		XXXXXX	XXXXXX				
1C3.9	Leg extension 10.5 m (500-4x1272 DQT20)	16	leg		XXXXXX	XXXXXX				
1C4	Tower type DQT40									
1C4.1	Basic body (500-4x1272 DQT40)	10	body		XXXXXX	XXXXXX				
1C4.2	Body extension 7.5 m (500-4x1272 DQT40)	3	body		XXXXXX	XXXXXX				
1C4.3	Leg extension 3.0 m (500-4x1272 DQT40)	4	leg		XXXXXX	XXXXXX				
1C4.4	Leg extension 4.5 m (500-4x1272 DQT40)	4	leg		XXXXXX	XXXXXX				
1C4.5	Leg extension 6.0 m (500-4x1272 DQT40)	4	leg		XXXXXX	XXXXXX				
1C4.6	Leg extension 7.5 m (500-4x1272 DQT40)	4	leg		XXXXXX	XXXXXX				
1C4.7	Leg extension 9.0 m (500-4x1272 DQT40)	4	leg		XXXXXX	XXXXXX				
1C4.8	Leg extension 10.5 m (500-4x1272 DQT40)	20	leg		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1C5	Tower type DQT60									
1C5.1	Basic body (500-4x1272 DQT60)	9	body		XXXXXX	XXXXXX				
1C5.2	Body extension 7.5 m (500-4x1272 DQT60)	2	body		XXXXXX	XXXXXX				
1C5.3	Leg extension 3.0 m (500-4x1272 DQT60)	4	leg		XXXXXX	XXXXXX				
1C5.4	Leg extension 4.5 m (500-4x1272 DQT60)	4	leg		XXXXXX	XXXXXX				
1C5.5	Leg extension 6.0 m (500-4x1272 DQT60)	4	leg		XXXXXX	XXXXXX				
1C5.6	Leg extension 7.5 m (500-4x1272 DQT60)	12	leg		XXXXXX	XXXXXX				
1C5.7	Leg extension 9.0 m (500-4x1272 DQT60)	4	leg		XXXXXX	XXXXXX				
1C5.8	Leg extension 10.5 m (500-4x1272 DQT60)	8	leg		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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		
1C6	Tower type DQT90									
1C6.1	Basic body (500-4x1272 DQT90) - Tension tower	1	body		XXXXX	XXXXX				
1C6.2	Body extension 7.5 m (500-4x1272 DQT90)	1	body		XXXXX	XXXXX				
1C6.3	Leg extension 10.5 m (500-4x1272 DQT90)	4	leg		XXXXX	XXXXX				
1C7	Tower type DQTR									
1C7.1	Basic body (500-4x1272 DQTR)	6	body		XXXXX	XXXXX				
1C7.2	Body extension 7.5 m (500-4x1272 DQTR)	1	body		XXXXX	XXXXX				
1C7.3	Leg extension 3.0 m (500-4x1272 DQTR)	4	leg		XXXXX	XXXXX				
1C7.4	Leg extension 4.5 m (500-4x1272 DQTR)	4	leg		XXXXX	XXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1C7.5	Leg extension 6.0 m (500-4x1272 DQTR)	4	leg		XXXXXX	XXXXXX				
1C7.6	Leg extension 7.5 m (500-4x1272 DQTR)	4	leg		XXXXXX	XXXXXX				
1C7.7	Leg extension 9.0 m (500-4x1272 DQTR)	4	leg		XXXXXX	XXXXXX				
1C7.8	Leg extension 10.5 m (500-4x1272 DQTR)	4	leg		XXXXXX	XXXXXX				
1C8	Tower sign									
1C8.1	Aerial patrol signs	64	piece		XXXXXX	XXXXXX	included in installation work	included in installation work		
1C8.2	Phasing signs (3 pieces per set)	42	set		XXXXXX	XXXXXX	included in installation work	included in installation work		
1C8.3	Circuit name signs	2	piece		XXXXXX	XXXXXX	included in installation work	included in installation work		

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1C8.4	Danger signs	24	piece		XXXXXX	XXXXXX	included in installation work	included in installation work		
1C8.5	Warning signs	8	piece		XXXXXX	XXXXXX	included in installation work	included in installation work		
1C8.6	R.O.W Access sign for preserved forests as per Drawing No.TP-161C	10	set		XXXXXX	XXXXXX	included in installation work	included in installation work		
Total Price for 1C							Baht		Baht	

**1D : INSULATOR STRING AND OVERHEAD GROUND WIRE ASSEMBLIES**

IMPORTANT :

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1D1	45°/45° V-string suspension Assembly 3D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	666	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1D2	45°/45° V-string suspension Assembly 8D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	66	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1D3	Deadend Assembly 13D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	12	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1D4	Deadend Assembly 13AD for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	108	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work



Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1D5	Deadend Assembly 14D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	258	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1D6	Inverted Deadend Assembly 14D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	18	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1D7	Deadend Assembly 15D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	12	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1D8	Jumper support Assembly 17D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	237	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1D9	Shield wire suspension (Insulated) Assembly 1 for 3/8" extra high strength galvanized steel wire (Excluding vibration damper and insulator)	89	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1D10	Shield wire suspension (Grounded) Assembly 2 for 3/8" extra high strength galvanized steel wire (Excluding vibration damper and insulator)	33	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1D11	Shield wire deadend (Insulated) Assembly 11 for 3/8" extra high strength galvanized steel wire (Excluding vibration damper and insulator)	51	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1D12	Shield wire deadend (Grounded) Assembly 12 for 3/8" extra high strength galvanized steel wire (Excluding vibration damper and insulator)	17	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1D13	Porcelain or glass insulator ANSI CLASS 52-8 (36,000 lbs) with corrosion proof type pin. In case of porcelain insulator the quantity of each color shall be : a. Brown glaze 46,449 discs b. Light grey glaze 3,714 discs	50163	disc						Included in stringing work	Included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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	
1D14	Porcelain or glass insulator ANSI CLASS 52-11 (50,000 lbs) with corrosion proof type pin. In case of porcelain insulator the quantity of each color shall be : a. Brown glaze 19,800 discs b. Light grey glaze 1,584 discs	21384	disc							Included in stringing work	Included in stringing work
1D15	Porcelain or glass insulator ANSI CLASS 52-8 (36,000 lbs) with corrosion proof type pin (to be used with item 1D11, in case of porcelain insulator the color shall be Brown glaze)	52	disc							Included in stringing work	Included in stringing work
1D16	Insulator strain type ANSI CLASS 54-2 (to be used with item 1D9)	89	disc							Included in stringing work	Included in stringing work
Total Price for 1D						Baht		Baht			

## 1E : CONDUCTOR AND OVERHEAD GROUND WIRE

### IMPORTANT :

1. EGAT will furnish conductor for this work in accordance with Article F-3. Equipment to be furnished by EGAT.
2. The conductor supplied under this Schedule shall be furnished in returnable metal reels having the length per reel of 2.4 kilometers.
3. The price for stringing and installation work of conductor shall include handling and transportation charges of conductor from Bangkok and/or its vicinity to the site.
4. The installation of conductor and shield wires on slack tension approach spans of the transmission line shall generally conform to Drawing No. E08-002.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1E1	1272 MCM ACSR/GA Conductor									
1E1.1	1272 MCM ACSR/GA Conductor, furnishing conductor for item 1E1.2, 1E1.3 and 1E1.4 (to be supplied by EGAT, see Article F-3), approximately 63.6 kilometers in transmission line distance		km		XXXXXX	XXXXXX	XXXXXX	XXXXXX	included in stringing work	included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1E1.2	Stringing of conductor by controlled tension method, double circuit, 3 phase, quad-bundled conductor per phase, measured based on horizontal distance of line route deadend Tower No.159 type DQT60 at KM.63 to deadend Tower at Den Chai Substation	63.5	km		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
1E1.3	Installation of conductor, double circuit, 3 phase, four-bundled conductor per phase, between deadend tower and take-off structure at Den Chai Substation as per Drawing No.T04-002, approx. 0.1 km in transmission line distance	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
1E2	Handling and transportation of empty returnable metal reel from the site to Bangkok and/or its vicinity, at the point designated by EGAT (See Article F-3 and F-4)	646	reel		XXXXXX	XXXXXX	XXXXXX	XXXXXX		

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1E3	3/8" nominal diameter, extra high strength galvanized steel shield wire, class A coating									
1E3.1	3/8" Extra high strength galvanized steel wire (Furnishing for item 1E3.2 and 1E3.3) based on linear length (Linear length = No. of shield wire x horizontal distance of line route + 1.5%)	64.8	km						included in stringing work	included in stringing work
1E3.2	Stringing by controlled tension method, one shield wire, measured based on horizontal distance of line route from Tower No.159 type DQT60 at KM.63 to deadend tower at Den Chai Substation	63.5	km		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
1E3.3	Installation of three shield wires between deadend tower and take-off structure at Den Chai Substation as per Drawing No. T04-002, approx. 0.1 km in transmission line distance	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
Total Price for 1E							Baht		Baht	

**1F : LINE ACCESSORIES**

**IMPORTANT :**

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1F1	Full tension splices for 1272 MCM ACSR/GA conductor	646	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1F2	Full tension splices for 3/8" extra high strength, galvanized steel shield wire	18	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1F3	Spacer damper for four-bundled 1272 MCM ACSR/GA conductor (for double circuit, approx. 63.6 km in transmission line distance)	lump sum	each		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1F4	Rigid spacer for two-bundled 1272 MCM ACSR/GA conductor	408	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1F5	Rigid spacer for four-bundled 1272 MCM ACSR/GA conductor	648	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1F6	Vibration damper for 3/8" extra high strength galvanized steel shield wire	158	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
1F7	Field test of spacer damper for four-bundled as per Article F-9 b. of the Specifications No. L-500 kV	1	test		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
Total Price for 1F							Baht		Baht	



## 1G : GROUNDING MATERIALS

### IMPORTANT :

1. The Contractor is required to perform the work of driving of ground rod as specified below at the Contractor's cost.
  - 1.1 All standard ground rods may be driven by hand operated weight pipe or by mechanically operated hammer.
  - 1.2 All sectional ground rods shall be driven only by mechanically operated hammer.
2. The mechanically operated hammer to be used may be either electric, pneumatic or petrol engine drive.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1G1	Tower Grounding									
1G1.1	No.8 AWG dead soft galvanized steel wire	2480	m							
1G1.2	No.2 AWG solid copper-clad steel wire	14415	m							
1G1.3	Exothermic connector type "CS" for cable to steel surface	620	piece							
1G1.4	Exothermic connector type "CR1" for parallel cable to ground rod	684	piece							
1G1.5	Exothermic connector type "CR2" for perpendicular cable to ground rod	636	piece							

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1G1.6	Exothermic connector type "CC" for cable to cable	64	piece							
1G1.7	1.6 cm. nominal diameter x 3.0 m. (5/8" diameter x 10') copper-covered steel standard ground rod	684	piece							
1G1.8	1.6 cm. nominal diameter x 3.0 m. (5/8" diameter x 10') copper-covered steel sectional ground rod with coupling	20	set							
1G2	Fence/metal object grounding (to be performed at location directed by EGAT)									
1G2.1	1.6 cm. nominal diameter x 3.0 m. (5/8" diameter x 10') galvanized steel standard ground rod	6	piece							
1G2.2	Galvanized double saddle steel ground rod clamp	6	set							

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1G2.3	8 mm.(5/16") 7-strand galvanized steel ground wire	30	m							
1G2.4	Galvanized steel crimpet	10	set							
1G2.5	19 mm. diameter bronze split bolt	6	set							
1G2.6	9.5 mm. (3/8") galvanized steel staples	60	piece							
Total Price for 1G							Baht		Baht	

# 1H : OPTICAL FIBER AND LINE ACCESSORIES

## IMPORTANT :

1. All lump sum price shall be based on horizontal distance of line route as specified else-where between the take-off structure. In case of changing of such horizontal distance of line route, the lump sum prices shall be adjusted accordingly.
2. For breakdown price tab sheet, bidder shall fill in all data required for item No., description, estimated Qty, Unit price. Amount price for each item will be calculated automatically.
3. 36 core non-metallic optical fiber cable for connecting insulated joint boxes on the towers shall be supplied with the sufficient amount for the installation by contractor.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1H1	Composite overhead ground wire with 36 cores Optical fibers (OPGW) (referred section F-4.3)									
1H1.1	Furnishing OPGW (11.4 mm diameter)	lump sum	each						included in item 1h1.2	included in item 1h1.2
1H1.2	Stringing by controlled tension method, one OPGW measured based on horizontal distance of line route from KM.63 to Den Chai (DC) substation to (Direction from Nan to Den Chai)	63.6	km		XXXXXX	XXXXXX	XXXXXX	XXXXXX		

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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	
1H1.3	Supply and intallation of hardware assemblies and line accessories include splicing work for overhead ground wire with optical fiber (OPGW) including: (a) Warning signs requires as shown on drawing No.TP150.1 (b) 2-way joint box with accessories (c) 2-way joint box with insulator and accessories (d) OPGW suspension (Insulated) assembly 21 with armor rods (excluding insulator and vibration damper) (e) OPGW suspension (Grounded) assembly 22 with armor rods (excluding vibration damper) (f) OPGW tension (Insulated) assembly 23 with armor rods and arcing horns (excluding insulator and vibration damper) (g) OPGW tension (Grounded) assembly 24 with armor rods (excluding vibration damper) (h) Vibration damper assembly with accessories (i) Parallel groove clamps (j) Grounding clamps (k) 1-wire cleat without insulator (l) 2-wire cleat without insulator (m) 6-wire cleat without insulator (n) 1-wire cleat with insulator (o) 2-wire cleat with insulator (p) 6-wire cleat with insulator (q) Porcelain or glass insulator ANSI CLASS 52-8 (36,000 lbs) with corrosion proof type pin (r) Insulator strain type ANSI CLASS 54-2 (s) 3/8" Extra high strength galvanized steel wire for grounding OPGW to tower	lump sum	each							included in item 1h1.2	included in item 1h1.2

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
1H2	Field testing for optical fiber for item 1H	1	test		XXXXXX	XXXXXX	XXXXXX	XXXXXX	included in item 1h1.2	included in item 1h1.2
Total Price for 1H							Baht		Baht	

Breakdown Price for 1H

IMPORTANT :

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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	

# 1N : TEST OF EQUIPMENT

## IMPORTANT :

1. EGAT reserves the right to omit any test if, in the opinion of EGAT, it deems that the proposed Equipment is reliable enough.
2. If any of these tests of Equipment do not satisfy the requirements of the specifications, the cost of retest shall be borne by the Contractor.

Item No.	Description	Estimated Qty.	Unit	Currency	Foreign Currency		Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount	Unit Price	Amount
1N1	Coronas and RIV tests of complete conductor, insulator and hardware assemblies in accordance with Article D-7 a. (1) of the Specification No. L-500 kV							
1N1.1	For 45°/45° V-string suspension Assembly 3D	1	test					
1N1.2	For 45°/45° V-string suspension Assembly 8D	1	test					
1N1.3	For Conductor Deadend Assembly 13D	1	test					
1N1.4	For Conductor Deadend Assembly 13AD	1	test					
1N1.5	For Conductor Deadend Assembly 14D	1	test					
1N1.6	For Conductor Deadend Assembly 15D	1	test					
1N1.7	For Jumper support Assembly 17D	1	test					



Item No.	Description	Estimated Qty.	Unit	Currency	Foreign Currency		Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount	Unit Price	Amount
1N2	Power arc test of insulator strings in accordance with Article D-7 c. (4) of the Specification No. L-500 kV							
1N2.1	For insulator ANSI class 52-8 (36,000 lbs)	1	test					
1N2.2	For insulator ANSI class 52-11 (50,000 lbs)	1	test					
1N3	Thermal-mechanical performance test in accordance with Article D-7 c. (5) of the Specification No. L-500 kV							
1N3.1	For insulator ANSI class 52-8 (36,000 lbs)	1	test					
1N3.2	For insulator ANSI class 52-11 (50,000 lbs)	1	test					
1N4	Steep wave front impulse test in accordance with Article D-7 c. (6) of the Specification No. L-500 kV							
1N4.1	For insulator ANSI class 52-8 (36,000 lbs)	1	test					
1N4.2	For insulator ANSI class 52-11 (50,000 lbs)	1	test					
Total Price for 1N							Baht	

**10 : SUPPLY OF SERVICE OF VEHICLES**

IMPORTANT :

Item No.	Description	Estimated Qty.	Unit	Local Transportation, Construction and Installation ( excluding VAT ) Baht	
				Unit Price	Amount
101	Services of four-wheel-driven vehicle (for Specifications and requirements of Vehicles, Refer to Article G-6. Housing and Other Facilities.)	104	car-month		
<b>Total Price for 10</b>				<b>Baht</b>	

INVITATION TO BID NO. NPUP-L-04  
TOTAL PRICE FOR SCHEDULE NO. 2  
SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO CCT. NO.1 AND CCT. NO.4 TO DEN CHAI SUBSTATION  
Line Length 6 KM

SUPPLY AND CONSTRUCTION OF TRANSMISSION LINE FOR SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO TO DEN CHAI SUBSTATION  
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment	Supply of Equipment	Foreign Currency	Local Currency	Local Transportation	Local Transportation, Construction and Installation	Purchase Price Offered for Dismantled Equipment
		Foreign Supply	Local Supply					
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht					
		Amount	Amount					
2A : PRELIMINARY WORK								
2B : TOWER FOUNDATIONS								
2C : TOWERS								
2D : INSULATOR STRING AND OVERHEAD GROUND WIRE ASSEMBLIES								
2E : CONDUCTOR AND OVERHEAD GROUND WIRE								

Description	Currency	Supply of Equipment	Supply of Equipment	Foreign Currency	Local Currency	Local Transportation	Local Transportation, Construction and Installation	Purchase Price Offered for Dismantled Equipment
		Foreign Supply	Local Supply					
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht		( excluding VAT ) Baht	( excluding VAT ) Baht	( excluding VAT ) Baht	( including VAT ) Baht
		Amount	Amount		Amount	Amount	Amount	Amount
2F : LINE ACCESSORIES								
2G : GROUNDING MATERIALS								
2H : OPTICAL FIBER AND LINE ACCESSORIES								
TOTAL PRICE			Baht		Baht	Baht	Baht	Baht
							Baht	

**INVITATION TO BID NO. NPUP-L-04**

**SCHEDULE NO. 2**

**2A : PRELIMINARY WORK**

**IMPORTANT :**

1. In case horizontal distance of line route is changed, the lump sum prices shall be adjusted accordingly.
2. The entire tree stump and root ball of eucalyptus, sugar cane and bamboo shall be completely excavated from the ground.

Item No.	Description	Estimated Qty.	Unit	Local Transportation, Construction and Installation ( excluding VAT ) Baht	
				Unit Price	Amount
2A1	Check survey and staking of tower location (approximately 6 km in transmission line distance)	lump sum	each		
2A2	Clearing right-of-way of 30 meters in width on each side of the center line of the transmission line (approximately 6 km in transmission line distance)	lump sum	each		
2A3	Sub-soil tests and preliminary measurement of ground resistance and earth resistivity at the depth and locations as directed by EGAT (to be performed at the depth and locations as directed by EGAT)				
2A3.1	Standard penetration tests and preliminary measurement of ground resistance and earth resistivity at the depth and locations as directed by EGAT (Approximately 18 bores)	180	m		

Item No.	Description	Estimated Qty.	Unit	Local Transportation, Construction and Installation ( excluding VAT ) Baht	
				Unit Price	Amount
2A4	Boundary post along boundary line of right-of-way	36	post		
Total Price for 2A				Baht	

## 2B : TOWER FOUNDATIONS

### IMPORTANT :

1. Pedestal height for all tower foundations shall be 1.0 meter, except as directed by EGAT.
2. The quoted price for additional reinforced concrete work including forms shall be consistent with the price quoted for tower foundation work. Moreover, the payment shall be made only for additional reinforced concrete work caused by modification of foundation design or additional work directed by EGAT.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2B1	Foundation for tower type DQV3									
2B2.1	Stub angle (500-4x1272 DQV3) and pad foundation type CV	2	tower		XXXXXX	XXXXXX				
2B2.2	Stub angle (500-4x1272 DQV3) and pad foundation type CIV	2	tower		XXXXXX	XXXXXX				
2B2.3	Stub angle (500-4x1272 DQV3) and pad foundation type CIII	2	tower		XXXXXX	XXXXXX				
2B2.4	Stub angle (500-4x1272 DQV3) and pad foundation type CS	2	tower		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2B2	Foundation for tower type DQT20									
2B2.1	Stub angle (500-4x1272 DQT20) and pad foundation type CV	1	tower		XXXXX	XXXXX				
2B2.2	Stub angle (500-4x1272 DQT20) and pad foundation type CIII	1	tower		XXXXX	XXXXX				
2B3	Foundation for tower type DQT40									
2B3.1	Stub angle (500-4x1272 DQT40) and pad foundation type CV	1	tower		XXXXX	XXXXX				
2B3.2	Stub angle (500-4x1272 DQT40) and pad foundation type CIII	1	tower		XXXXX	XXXXX				
2B4	Foundation for tower type DQT60									
2B4.1	Stub angle (500-4x1272 DQT60) and pad foundation type CV	1	tower		XXXXX	XXXXX				
2B4.2	Stub angle (500-4x1272 DQT60) and pad foundation type CIV	1	tower		XXXXX	XXXXX				



Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2B4.3	Stub angle (500-4x1272 DQT60) and pad foundation type CIII	1	tower		XXXXXX	XXXXXX				
2B4.4	Stub angle (500-4x1272 DQT60) and pad foundation type CS	1	tower		XXXXXX	XXXXXX				
2B5	Foundation for tower type DQT90									
2B.1	Stub angle (500-4x1272 DQT90) and pad foundation type CV	1	tower		XXXXXX	XXXXXX				
2B5.2	Stub angle (500-4x1272 DQT90) and pad foundation type CIII	1	tower		XXXXXX	XXXXXX				
Total Price for 2B							Baht		Baht	

## 2C : TOWERS

### IMPORTANT :

1. The quoted price for additional galvanized steel shall be consistent with the prices quoted for steel towers. Payment for additional galvanized steel shall be made in accordance with the terms stipulated in Article F-11. Basis of Payment.
2. In addition to Specifications No.L-500 kV, Article A-5. Fabrication, item h. Markings, all individual pieces shall also be marked with the word "ฉฟผ" together with the designations shown on detailed drawings.
3. Attachment devices as shackles or others for assemblies of Conductor, shield wire and OPGW shall be supplied with towers.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2C1	Tower type DQV3									
2C1.1	Basic body (500-4x1272 DQV3)	8	body		XXXXXX	XXXXXX				
2C1.2	Body extension 7.5 m (500-4x1272 DQV3)	2	body		XXXXXX	XXXXXX				
2C1.3	Leg extension 1.5 m (500-4x1272 DQV3)	4	leg		XXXXXX	XXXXXX				
2C1.4	Leg extension 3.0 m (500-4x1272 DQV3)	4	leg		XXXXXX	XXXXXX				
2C1.5	Leg extension 4.5 m (500-4x1272 DQV3)	8	leg		XXXXXX	XXXXXX				
2C1.6	Leg extension 6.0 m (500-4x1272 DQV3)	8	leg		XXXXXX	XXXXXX				
2C1.7	Leg extension 9.0 m (500-4x1272 DQV3)	4	leg		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2C1.8	Leg extension 10.5 m (500-4x1272 DQV3)	4	leg		XXXXXX	XXXXXX				
2C2	Tower type DQT20									
2C2.1	Basic body (500-4x1272 DQT20)	2	body		XXXXXX	XXXXXX				
2C2.2	Leg extension 6.0 m (500-4x1272 DQT20)	4	leg		XXXXXX	XXXXXX				
2C2.3	Leg extension 7.5 m (500-4x1272 DQT20)	4	leg		XXXXXX	XXXXXX				
2C3	Tower type DQT40									
2C3.1	Basic body (500-4x1272 DQT40)	2	body		XXXXXX	XXXXXX				
2C3.2	Leg extension 4.5 m (500-4x1272 DQT40)	4	leg		XXXXXX	XXXXXX				
2C3.3	Leg extension 6.0 m (500-4x1272 DQT40)	4	leg		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2C4	Tower type DQT60									
2C4.1	Basic body (500-4x1272 DQT60)	4	body		XXXXXX	XXXXXX				
2C4.2	Leg extension 3.0 m (500-4x1272 DQT60)	4	leg		XXXXXX	XXXXXX				
2C4.3	Leg extension 6.0 m (500-4x1272 DQT60)	8	leg		XXXXXX	XXXXXX				
2C4.4	Leg extension 9.0 m (500-4x1272 DQT60)	4	leg		XXXXXX	XXXXXX				
2C5	Tower type DQT90									
2C5.1	Basic body (500-4x1272 DQT90) - Terminal tower	2	body		XXXXXX	XXXXXX				
2C5.2	Body extension 7.5 m (500-4x1272 DQT90)	2	body		XXXXXX	XXXXXX				
2C5.3	Leg extension 7.5 m (500-4x1272 DQT90)	4	leg		XXXXXX	XXXXXX				
2C5.4	Leg extension 10.5 m (500-4x1272 DQT90)	4	leg		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2C6	Tower sign									
2C6.1	Aerial patrol signs	8	piece		XXXXXX	XXXXXX	included in installation work	included in installation work		
2C6.2	Phasing signs (3 pieces per set)	8	set		XXXXXX	XXXXXX	included in installation work	included in installation work		
2C6.3	Circuit name signs	8	piece		XXXXXX	XXXXXX	included in installation work	included in installation work		
2C6.4	Danger signs	5	piece		XXXXXX	XXXXXX	included in installation work	included in installation work		
Total Price for 2C							Baht		Baht	

**2D : INSULATOR STRING AND OVERHEAD GROUND WIRE ASSEMBLIES**

IMPORTANT :

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2D1	45°/45° V-string suspension Assembly 3D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	48	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
2D2	Deadend Assembly 13D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	48	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
2D3	Deadend Assembly 13AD for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	12	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
2D4	Deadend Assembly 14D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	48	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
2D5	Deadend Assembly 15D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	20	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2D6	Inverted Deadend Assembly 15D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	4	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
2D7	Jumper support Assembly 17D for quad-bundled 1272 MCM ACSR/GA conductor (Excluding insulator)	84	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
2D8	Shield wire suspension (Grounded) Assembly 2 for 3/8" extra high strength galvanized steel wire (Excluding vibration damper and insulator)	8	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
2D9	Shield wire deadend (Insulated) Assembly 11 for 3/8" extra high strength galvanized steel wire (Excluding vibration damper and insulator)	10	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
2D10	Shield wire deadend (Grounded) Assembly 12 for 3/8" extra high strength galvanized steel wire (Excluding vibration damper and insulator)	20	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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	
2D11	Porcelain or glass insulator ANSI CLASS 52-8 (36,000 lbs) with corrosion proof type pin. In case of porcelain insulator the quantity of each color shall be : a. Brown glaze 5,748 discs b. Light grey glaze 456 discs	6204	disc							included in stringing work	included in stringing work
2D12	Porcelain or glass insulator ANSI CLASS 52-11 (50,000 lbs) with corrosion proof type pin. In case of porcelain insulator the quantity of each color shall be : a. Brown glaze 5,400 discs b. Light grey glaze 432 discs	5832	disc							included in stringing work	included in stringing work
2D13	Porcelain or glass insulator ANSI CLASS 52-8 (36,000 lbs) with corrosion proof type pin (to be used with item 2D9, in case of porcelain insulator the color shall be Brown glaze)	10	disc							included in stringing work	included in stringing work
Total Price for 2D								Baht		Baht	



## 2E : CONDUCTOR AND OVERHEAD GROUND WIRE

### IMPORTANT :

1. EGAT will furnish conductor for this work in accordance with Article F-3. Equipment to be furnished by EGAT.
2. The conductor supplied under this Schedule shall be furnished in returnable metal reels having the length per reel of 2.4 kilometers.
3. The price for stringing and installation work of conductor shall include handling and transportation charges of conductor from Bangkok and/or its vicinity to the site.
4. The installation of conductor and shield wires on slack tension approach spans of the transmission line shall generally conform to Drawing No. E08-002.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
	<u>500 kV Mae Moh 3 - Den Chai</u> <u>(Circuit No.1 and Circuit No.4)</u>									
2E1	1272 MCM ACSR/GA Conductor									
2E1.1	1272 MCM ACSR/GA Conductor, furnishing conductor for item 2E1.2 and 2E1.3 (to be supplied by EGAT, see Article F-3), approximately 3 kilometers in transmission line distance		km		XXXXXX	XXXXXX	XXXXXX	XXXXXX	included in stringing work	included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2E1.2	Stringing of conductor by controlled tension method, double circuit, 3 phase, quad-bundled conductor per phase, measured based on horizontal distance of line route from existing Tower No.48/3 type DQV9(3) at Den Chai Junction (West) to new deadend Tower type DQT60 at Den Chai Substation, as per drawing No.T04-001	2.9	km		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
2E1.3	Installation of conductor, double circuit, 3 phase, four-bundled conductor per phase, between new deadend tower type DQT60 and take-off structure at Den Chai Substation as per Drawing No.T04-002, approx. 0.1 km in transmission line distance	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2E2	3/8" nominal diameter, extra high strength galvanized steel shield wire, class A coating									
2E2.1	3/8" Extra high strength galvanized steel wire (Furnishing for item 2E2.2 and 2E2.3) based on linear length (Linear length = No. of shield wire x horizontal distance of line route + 1.5%)	3.3	km						included in stringing work	included in stringing work
2E2.2	Stringing by controlled tension method, one shield wire, measured based on horizontal distance of line route from existing tower No.48/3 type DQV9(3) at Den Chai Junction (West) to new deadend tower type DQT60 at Den Chai Substation, as per drawing No.T04-001	2.9	km		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
2E2.3	Installation of three shield wires between new deadend tower type DQT60 and take-off structure at Den Chai Substation as per Drawing No. T04-002, approx. 0.1 km in transmission line distance	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2E3	500 kV Den Chai - Tha Tako (Circuit No.1 and Circuit No.4)									
2E3.1	1272 MCM ACSR/GA Conductor  1272 MCM ACSR/GA Conductor, furnishing conductor for item 2E3.2 and 2E3.3 (to be supplied by EGAT, see Article F-3), approximately 3 kilometers in transmission line distance		km		XXXXXX	XXXXXX	XXXXXX	XXXXXX	included in stringing work	included in stringing work
2E3.2	Stringing of conductor by controlled tension method, double circuit, 3 phase, quad- bundled conductor per phase, measured based on horizontal distance of line route from new deadend Tower type DQT60 at Den Chai Substation to existing Tower No.49/1 type DQV3 at Den Chai Junction (West), as per drawing No.T04-001	2.9	km		XXXXXX	XXXXXX	XXXXXX	XXXXXX		

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2E3.3	Installation of conductor, double circuit, 3 phase, four-bundled conductor per phase, between new deadend tower type DQT60 and take-off structure at Den Chai Substation as per Drawing No.T04-002, approx. 0.1 km in transmission line distance	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
2E4	3/8" nominal diameter, extra high strength galvanized steel shield wire, class A coating									
2E4.1	3/8" Extra high strength galvanized steel wire (Furnishing for item 2E2.2 and 2E2.3) based on linear length (Linear length = No. of shield wire x horizontal distance of line route + 1.5%)	3.3	km		XXXXXX	XXXXXX			included in stringing work	included in stringing work
2E4.2	Stringing by controlled tension method, one shield wire, measured based on horizontal distance of line route from new deadend tower type DQT60 at Den Chai Substation to existing tower No.49/1 type DQV3 at Den Chai Junction (West), as per drawing No.T04-001	2.9	km		XXXXXX	XXXXXX	XXXXXX	XXXXXX		

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2E4.3	Installation of three shield wires between new deadend tower type DQT60 and take-off structure at Den Chai Substation as per Drawing No. T04-002, approx. 0.1 km in transmission line distance	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
2E5	Handling and transportation of empty returnable metal reel from the site to Bangkok and/or its vicinity, at the point designated by EGAT (See Article F-3 and F-4)	61	reel		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
Total Price for 2E							Baht		Baht	

**2F : LINE ACCESSORIES**

**IMPORTANT :**

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2F1	Full tension splices for 1272 MCM ACSR/GA conductor	61	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
2F2	Full tension splices for 3/8" extra high strength, galvanized steel shield wire	2	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
2F3	Spacer damper for four-bundled 1272 MCM ACSR/GA conductor (for double circuit, approx. 6 km in transmission line distance)	lump sum	each		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
2F4	Rigid spacer for two-bundled 1272 MCM ACSR/GA conductor	60	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2F5	Rigid spacer for four-bundled 1272 MCM ACSR/GA conductor	90	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
2F6	Vibration damper for 3/8" extra high strength galvanized steel shield wire	12	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
Total Price for 2F							Baht		Baht	



## 2G : GROUNDING MATERIALS

### IMPORTANT :

1. The Contractor is required to perform the work of driving of ground rod as specified below at the Contractor's cost.
  - 1.1 All standard ground rods may be driven by hand operated weight pipe or by mechanically operated hammer.
  - 1.2 All sectional ground rods shall be driven only by mechanically operated hammer.
2. The mechanically operated hammer to be used may be either electric, pneumatic or petrol engine drive.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2G1	Tower Grounding									
2G1.1	No.8 AWG dead soft galvanized steel wire	288	m							
2G1.2	No.2 AWG solid copper-clad steel wire	1674	m							
2G1.3	Exothermic connector type "CS" for cable to steel surface	72	piece							
2G1.4	Exothermic connector type "CR1" for parallel cable to ground rod	80	piece							
2G1.5	Exothermic connector type "CR2" for perpendicular cable to ground rod	76	piece							

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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	
2G1.6	Exothermic connector type "CC" for cable to cable	8	piece								
2G1.7	1.6 cm. nominal diameter x 3.0 m. (5/8" diameter x 10') copper-covered steel standard ground rod	80	piece								
2G1.8	1.6 cm. nominal diameter x 3.0 m. (5/8" diameter x 10') copper-covered steel sectional ground rod with coupling	20	set								
Total Price for 2G							Baht		Baht		

## 2H : OPTICAL FIBER AND LINE ACCESSORIES

### IMPORTANT :

1. All lump sum price shall be based on horizontal distance of line route as specified else-where between the take-off structure. In case of changing of such horizontal distance of line route, the lump sum prices shall be adjusted accordingly.
2. For breakdown price tab sheet, bidder shall fill in all data required for item No., description, estimated Qty, Unit price. Amount price for each item will be calculated automatically.
3. 36 core non-metallic optical fiber cable for connecting insulated joint boxes on the towers shall be supplied with the sufficient amount for the installation by contractor.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2H1	Composite overhead ground wire with 36 cores Optical fibers (OPGW) (referred section F-4.3)									
2H1.1	Furnishing OPGW (11.4 mm diameter)	lump sum	each						included in item 2H1.2	included in item 2H1.2
2H1.2	Stringing by controlled tension method, one OPGW measured based on horizontal distance of line route from Den Chai (DC) substation to Existing STR.No 48/3 at Den Chai Junction (Direction Mae Moh 3) CCT.1	3	km		XXXXXX	XXXXXX	XXXXXX	XXXXXX		

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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	
2H1.3	Supply and intallation of hardware assemblies and line accessories include splicing work for overhead ground wire with optical fiber (OPGW) including: (a) Warning signs requires as shown on drawing No.TP150.1 (b) 2-way joint box with accessories (c) 2-way joint box with insulator and accessories (d) OPGW suspension (Insulated) assembly 21 with armor rods (excluding insulator and vibration damper) (e) OPGW suspension (Grounded) assembly 22 with armor rods (excluding vibration damper) (f) OPGW tension (Insulated) assembly 23 with armor rods and arcing horns (excluding insulator and vibration damper) (g) OPGW tension (Grounded) assembly 24 with armor rods (excluding vibration damper) (h) Vibration damper assembly with accessories (i) Parallel groove clamps (j) Grounding clamps (k) 1-wire cleat without insulator (l) 2-wire cleat without insulator (m) 6-wire cleat without insulator (n) 1-wire cleat with insulator (o) 2-wire cleat with insulator (p) 6-wire cleat with insulator (q) Porcelain or glass insulator ANSI CLASS 52-8 (36,000 lbs) with corrosion proof type pin (r) Insulator strain type ANSI CLASS 54-2 (s) 3/8" Extra high strength galvanized steel wire for grounding OPGW to tower	lump sum	each								

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2H2	Field testing for optical fiber for item 2H1	1	test		XXXXXX	XXXXXX	XXXXXX	XXXXXX	included in item 2H1.2	included in item 2H1.2
2H3	Composite overhead ground wire with 36 cores Optical fibers (OPGW) (referred section F-4.3)									
2H3.1	Furnishing OPGW (11.4 mm diameter)	lump sum	each						included in item 2H3.2	included in item 2H3.2
2H3.2	Stringing by controlled tension method, one OPGW measured based on horizontal distance of line route from Den Chai (DC) substation to Existing STR.No 49/1 at Den Chai Junction (Direction Tha Tako) CCT.1	3	km		XXXXXX	XXXXXX	XXXXXX	XXXXXX		

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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	
2H3.3	Supply and intallation of hardware assemblies and line accessories include splicing work for overhead ground wire with optical fiber (OPGW) including: (a) Warning signs requires as shown on drawing No.TP150.1 (b) 2-way joint box with accessories (c) 2-way joint box with insulator and accessories (d) OPGW suspension (Insulated) assembly 21 with armor rods (excluding insulator and vibration damper) (e) OPGW suspension (Grounded) assembly 22 with armor rods (excluding vibration damper) (f) OPGW tension (Insulated) assembly 23 with armor rods and arcing horns (excluding insulator and vibration damper) (g) OPGW tension (Grounded) assembly 24 with armor rods (excluding vibration damper) (h) Vibration damper assembly with accessories (i) Parallel groove clamps (j) Grounding clamps (k) 1-wire cleat without insulator) (l) 2-wire cleat without insulator (m) 6-wire cleat without insulator (n) 1-wire cleat with insulator (o) 2-wire cleat with insulator (p) 6-wire cleat with insulator (q) Porcelain or glass insulator ANSI CLASS 52-8 (36,000 lbs) with corrosion proof type pin (r) Insulator strain type ANSI CLASS 54-2 (s) 3/8" Extra high strength galvanized steel wire for grounding OPGW to tower	lump sum	each							included in item 2H3.2	included in item 2H3.2

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
2H4	Field testing for optical fiber for item 2H3	1	test		XXXXXX	XXXXXX	XXXXXX	XXXXXX	included in item 2H3.2	included in item 2H3.2
Total Price for 2H							Baht		Baht	

Breakdown Price for 2H

IMPORTANT :

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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	



INVITATION TO BID NO. NPUP-L-04  
TOTAL PRICE FOR SCHEDULE NO. 3  
SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO CCT. NO.2 AND CCT. NO.3 TO DEN CHAI SUBSTATION  
Line Length 1.2 KM

SUPPLY AND CONSTRUCTION OF TRANSMISSION LINE FOR SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO TO DEN CHAI SUBSTATION  
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment	Supply of Equipment	Foreign Currency	Local Currency	Local Transportation	Local Transportation, Construction and Installation	Purchase Price Offered for Dismantled Equipment
		Foreign Supply	Local Supply					
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht					
		Amount	Amount					
3A : PRELIMINARY WORK								
3B : TOWER FOUNDATIONS								
3C : TOWERS								
3D : INSULATOR STRING AND OVERHEAD GROUND WIRE ASSEMBLIES								
3E : CONDUCTOR AND OVERHEAD GROUND WIRE								

Description	Currency	Supply of Equipment	Supply of Equipment	Foreign Currency	Local Currency	Local Transportation	Local Transportation, Construction and Installation	Purchase Price Offered for Dismantled Equipment
		Foreign Supply	Local Supply					
		CIF Thai Port	Ex-works Price ( excluding VAT )					
		Amount	Amount					
3F : LINE ACCESSORIES								
3G : GROUNDING MATERIALS								
3I : DISMANTLING WORK								
TOTAL PRICE			Baht		Baht	Baht	Baht	Baht
3Z : DISMANTLED EQUIPMENT TO BE PURCHASED BY THE CONTRACTOR							Baht	-1,471,240.00

**INVITATION TO BID NO. NPUP-L-04**

**SCHEDULE NO. 3**

**3A : PRELIMINARY WORK**

**IMPORTANT :**

1. In case horizontal distance of line route is changed, the lump sum prices shall be adjusted accordingly.
2. The entire tree stump and root ball of eucalyptus, sugar cane and bamboo shall be completely excavated from the ground.

Item No.	Description	Estimated Qty.	Unit	Local Transportation, Construction and Installation ( excluding VAT ) Baht	
				Unit Price	Amount
3A1	Check survey and staking of tower location (approximately 1.2 km in transmission line distance)	lump sum	each		
3A2	Clearing right-of-way of 30 meters in width on each side of the center line of the transmission line (approximately 0.5 km in transmission line distance)	lump sum	each		
3A3	Sub-soil tests and preliminary measurement of ground resistance and earth resistivity at the depth and locations as directed by EGAT (to be performed at the depth and locations as directed by EGAT)				
3A3.1	Standard penetration tests and preliminary measurement of ground resistance and earth resistivity at the depth and locations as directed by EGAT (Approximately 3 bores)	30	m		

Item No.	Description	Estimated Qty.	Unit	Local Transportation, Construction and Installation ( excluding VAT ) Baht	
				Unit Price	Amount
3A4	Boundary post along boundary line of right-of-way	6	post		
Total Price for 3A				Baht	

### 3B : TOWER FOUNDATIONS

**IMPORTANT :**

1. Pedestal height for all tower foundations shall be 1.0 meter, except as directed by EGAT.
2. The quoted price for additional reinforced concrete work including forms shall be consistent with the price quoted for tower foundation work. Moreover, the payment shall be made only for additional reinforced concrete work caused by modification of foundation design or additional work directed by EGAT.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
3B1	Foundation for tower type DQT60									
3B1.1	Stub angle (500-4x1272 DQT60) and pad foundation type CV	1	tower		XXXXXX	XXXXXX				
3B1.2	Stub angle (500-4x1272 DQT60) and pad foundation type CIII	1	tower		XXXXXX	XXXXXX				
3B2	Foundation for tower type DQT90									
3B2.1	Stub angle (500-4x1272 DQT90) and pad foundation type CV	1	tower		XXXXXX	XXXXXX				
Total Price for 3B							Baht		Baht	

### 3C : TOWERS

#### IMPORTANT :

1. The quoted price for additional galvanized steel shall be consistent with the prices quoted for steel towers. Payment for additional galvanized steel shall be made in accordance with the terms stipulated in Article F-11. Basis of Payment.
2. In addition to Specifications No.L-500 kV, Article A-5. Fabrication, item h. Markings, all individual pieces shall also be marked with the word "กฟผ" together with the designations shown on detailed drawings.
3. Attachment devices as shackles or others for assemblies of Conductor, shield wire and OPGW shall be supplied with towers.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
3C1	Tower type DQT60									
3C1.1	Basic body (500-4x1272 DQT60)	2	body		XXXXXX	XXXXXX				
3C1.2	Leg extension 3.0 m (500-4x1272 DQT60)	4	leg		XXXXXX	XXXXXX				
3C1.3	Leg extension 10.5 m (500-4x1272 DQT60)	4	leg		XXXXXX	XXXXXX				
3C2	Tower type DQT90									
3C2.1	Basic body (500-4x1272 DQT90) - Terminal tower	1	body		XXXXXX	XXXXXX				
3C2.2	Body extension 7.5 m (500-4x1272 DQT90)	1	body		XXXXXX	XXXXXX				

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
3C2.3	Leg extension 4.5 m (500-4x1272 DQT90)	4	leg		XXXXXX	XXXXXX				
3C3	Tower sign									
3C3.1	Aerial patrol signs	2	piece		XXXXXX	XXXXXX	included in installation work	included in installation work		
3C3.2	Phasing signs (3 pieces per set)	4	set		XXXXXX	XXXXXX	included in installation work	included in installation work		
3C3.3	Circuit name signs	8	piece		XXXXXX	XXXXXX	included in installation work	included in installation work		
3C3.4	Danger signs	3	piece		XXXXXX	XXXXXX	included in installation work	included in installation work		
Total Price for 3C							Baht		Baht	

### 3D : INSULATOR STRING AND OVERHEAD GROUND WIRE ASSEMBLIES

IMPORTANT :

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
3D1	Deadend Assembly 13 for four-bundled 795 kcmil ACSR/GA (CONDOR) conductor (Excluding insulator)	12	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
3D2	Deadend Assembly 13A for four-bundled 795 kcmil ACSR/GA (CONDOR) conductor (Excluding insulator)	12	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
3D3	Deadend Assembly 15A for four-bundled 795 kcmil ACSR/GA (CONDOR) conductor (Excluding insulator)	20	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
3D4	Inverted Deadend Assembly 15A for four-bundled 795 kcmil ACSR/GA (CONDOR) conductor (Excluding insulator)	4	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
3D5	Jumper support Assembly 17 for four-bundled 795 kcmil ACSR/GA (CONDOR) conductor (Excluding insulator)	24	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work



Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
3D6	Shield wire deadend (Insulated) Assembly 11 for 3/8" extra high strength galvanized steel wire (Excluding vibration damper and insulator)	8	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
3D7	Shield wire deadend (Grounded) Assembly 12 for 3/8" extra high strength galvanized steel wire (Excluding vibration damper and insulator)	16	set		XXXXXX	XXXXXX			included in stringing work	included in stringing work
3D8	Porcelain or glass insulator ANSI CLASS 52-8 (36,000 lbs) with corrosion proof type pin. In case of porcelain insulator the quantity of each color shall be : a. Brown glaze 1,848 discs b. Light grey glaze 144 discs	1992	disc						included in stringing work	included in stringing work
3D9	Porcelain or glass insulator ANSI CLASS 52-11 (50,000 lbs) with corrosion proof type pin. In case of porcelain insulator the quantity of each color shall be : a. Brown glaze 1,200 discs b. Light grey glaze 96 discs	1296	disc						included in stringing work	included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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	
3D10	Porcelain or glass insulator ANSI CLASS 52-8 (36,000 lbs) with corrosion proof type pin (to be used with item 3D6, in case of porcelain insulator the color shall be Brown glaze)	8	disc							included in stringing work	included in stringing work
Total Price for 3D						Baht		Baht			

### 3E : CONDUCTOR AND OVERHEAD GROUND WIRE

**IMPORTANT :**

1. EGAT will furnish conductor for this work in accordance with Article F-3. Equipment to be furnished by EGAT.
2. The conductor supplied under this Schedule shall be furnished in returnable metal reels having the length per reel of 2.4 kilometers.
3. The price for stringing and installation work of conductor shall include handling and transportation charges of conductor from Bangkok and/or its vicinity to the site.
4. The installation of conductor and shield wires on slack tension approach spans of the transmission line shall generally conform to Drawing No. E08-002.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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	
3E1	<u>500 kV Mae Moh 3 - Den Chai (Circuit No.2 and 3)</u> 795 kcmil ACSR/GA (CONDOR) Conductor										
3E1.1	795 kcmil ACSR/GA (CONDOR) Conductor, furnishing conductor for item 3E1.2 and 3E1.3 (to be supplied by EGAT, see Article F-3), approximately 0.5 kilometers in transmission line distance		km		XXXXXX	XXXXXX	XXXXXX	XXXXXX	included in stringing work	included in stringing work	

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
3E1.2	Stringing of conductor by controlled tension method, double circuit, 3 phase, quad-bundled conductor per phase, measured based on horizontal distance of line route from existing Tower No.55/1 type DL(3) to new deadend Tower type DQT60 at Den Chai Substation	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
3E1.3	Installation of conductor, double circuit, 3 phase, four-bundled conductor per phase, between new deadend tower type DQT60 and take-off structure at Den Chai Substation as per Drawing No.T04-002, approx. 0.2 km in transmission line distance	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
3E2	3/8" nominal diameter, extra high strength galvanized steel shield wire, class A coating									
3E2.1	3/8" Extra high strength galvanized steel wire (Furnishing for item 3E2.2 and 3E2.3) based on linear length (Linear length = No. of shield wire x horizontal distance of line route + 1.5%)	1.5	km						included in stringing work	included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
3E2.2	Stringing by controlled tension method, two shield wires, measured based on horizontal distance of line route from existing tower No.55/1 type DL(3) to new deadend tower type DQT60 at Den Chai Substation	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
3E2.3	Installation of four shield wires between new deadend tower type DQT60 and take-off structure at Den Chai Substation as per Drawing No. T04-002, approx. 0.2 km in transmission line distance	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
3E3	500 kV Den Chai - Tha Tako (Circuit No.2 and 3)									
	795 kcmil ACSR/GA (CONDOR) Conductor									
3E3.1	795 kcmil ACSR/GA (CONDOR) Conductor, furnishing conductor for item 3E3.2 and 3E3.3 (to be supplied by EGAT, see Article F-3), approximately 0.7 kilometers in transmission line distance		km		XXXXXX	XXXXXX	XXXXXX	XXXXXX	included in stringing work	included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
3E3.2	Stringing of conductor by controlled tension method, double circuit, 3 phase, quad-bundled conductor per phase, measured based on horizontal distance of line route from new deadend Tower type DQT90 at Den Chai Substation to existing Tower No.55/3 type DM(3)	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
3E3.3	Installation of conductor, double circuit, 3 phase, four-bundled conductor per phase, between new deadend tower type DQT90 and take-off structure at Den Chai Substation as per Drawing No.T04-002, approx. 0.2 km in transmission line distance	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
3E4	3/8" nominal diameter, extra high strength galvanized steel shield wire, class A coating									
3E4.1	3/8" Extra high strength galvanized steel wire (Furnishing for item 3E4.2 and 3E4.3) based on linear length (Linear length = No. of shield wire x horizontal distance of line route + 1.5%)	1.9	km						included in stringing work	included in stringing work

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
3E4.2	Stringing by controlled tension method, two shield wires, measured based on horizontal distance of line route from new deadend tower type DQT90 at Den Chai Substation to existing tower No.55/3 type DM(3)	0.5	km		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
3E4.3	Installation of four shield wires between new deadend tower type DQT90 and take-off structure at Den Chai Substation as per Drawing No. T04-002, approx. 0.2 km in transmission line distance	lump sum	each		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
3E5	Handling and transportation of empty returnable metal reel from the site to Bangkok and/or its vicinity, at the point designated by EGAT (See Article F-3 and F-4)	13	reel		XXXXXX	XXXXXX	XXXXXX	XXXXXX		
Total Price for 3E							Baht		Baht	

**3F : LINE ACCESSORIES**

IMPORTANT :

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
3F1	Spacer damper for four-bundled 795 kcmil ACSR/GA (CONDOR) conductor (for double circuit, approx. 1.2 km in transmission line distance)	lump sum	each		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
3F2	Rigid spacer for two-bundled 795 kcmil ACSR/GA (CONDOR) conductor	60	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
3F3	Rigid spacer for four-bundled 795 kcmil ACSR/GA (CONDOR) conductor	90	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
3F4	Vibration damper for 3/8" extra high strength galvanized steel shield wire	12	set		XXXXXX	XXXXXX			Included in stringing work	Included in stringing work
Total Price for 3F							Baht		Baht	



### 3G : GROUNDING MATERIALS

#### IMPORTANT :

1. The Contractor is required to perform the work of driving of ground rod as specified below at the Contractor's cost.
  - 1.1 All standard ground rods may be driven by hand operated weight pipe or by mechanically operated hammer.
  - 1.2 All sectional ground rods shall be driven only by mechanically operated hammer.
2. The mechanically operated hammer to be used may be either electric, pneumatic or petrol engine drive.

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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
3G1										
3G1.1	No.8 AWG dead soft galvanized steel wire	48	m							
3G1.2	No.2 AWG solid copper-clad steel wire	279	m							
3G1.3	Exothermic connector type "CS" for cable to steel surface	12	piece							
3G1.4	Exothermic connector type "CR1" for parallel cable to ground rod	16	piece							
3G1.5	Exothermic connector type "CR2" for perpendicular cable to ground rod	16	piece							

Item No.	Description	Estimated Qty.	Unit	Currency	Supply of Equipment		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	
3G1.6	Exothermic connector type "CC" for cable to cable	4	piece								
3G1.7	1.6 cm. nominal diameter x 3.0 m. (5/8" diameter x 10') copper-covered steel standard ground rod	16	piece								
3G1.8	1.6 cm. nominal diameter x 3.0 m. (5/8" diameter x 10') copper-covered steel sectional ground rod with coupling	20	set								
Total Price for 3G							Baht		Baht		

**3I : DISMANTLING WORK**

IMPORTANT :

Item No.	Description	Estimated Qty.	Unit	Local Transportation, Construction and Installation ( excluding VAT ) Baht	
				Unit Price	Amount
3I1	Dismantling of the existing 500 kV Mae Moh 3 - Tha Tako Transmission Line (Circuit No.2 and Circuit No.3), which is double circuit, quad-bundled conductor per phase between existing Tower No.55/1 type DL(3) and Tower No.55/3 type DM(3), approx. 0.8 km in transmission line distance	lump sum	each		
<b>Total Price for 3I</b>				<b>Baht</b>	

**3Z : DISMANTLED EQUIPMENT TO BE PURCHASED BY THE CONTRACTOR**

IMPORTANT :

Item No.	Description	Estimated Qty.	Unit	Purchase Price Offered for Dismantled Equipment ( including VAT ) Baht	
				Unit Price	Amount
3Z1	Dismantling equipment of the existing 500 kV Mae Moh 3 - Tha Tako Transmission Line (Circuit No.2 and Circuit No.3), which is double circuit, quad-bundled conductor per phase, between existing Tower No.55/1 type DL(3) and Tower No.55/3 type DM(3), approx. 0.8 km in transmission line distance				
<b>Total Price for 3Z</b>				<b>Baht</b>	<b>1,471,240.00</b>

**PART 2**  
**PROPOSAL & TECHNICAL DATA**  
**AND**  
**PAST SUPPLY RECORD**

PLEASE FILL OUT AND RETURN WITH YOUR PROPOSAL

500 kV NAN - DEN CHAI (FROM KM.63 TO DEN CHAI)  
AND SECTIONALIZING OF 500 kV MAE MOH 3 - THA  
TAKO TO DEN CHAI SUBSTATION

GALVANIZED STEEL TOWERS			Bidder	
PROPOSAL DATA			Item No.	
Name and country of tower fabricator			1	
			2 (if any)	
Location of tower fabricating plants			1	
			2 (if any)	
Location of tower test facility				
Description	Applicable Standard		Make and country of origins	
	Structural steel	High strength		
MATERIAL	Rolled shapes			
	Plates			
	Connection bolts & nuts			
	Lock nuts			
	U-bolts or shackles			
	Step bolts & nuts			
	Ladders			
	Spring washers			
GALVANIZING	TOWER	Standard		
		Weight of zinc coating  g/m <sup>2</sup>	Thickness < 3.2 mm	3.2 mm ≤ Thickness < 4.8 mm
			average.....minimum.....	average.....minimum.....
			4.8 mm ≤ Thickness < 6.4 mm	Thickness 6.4 mm and over
			average.....minimum.....	average.....minimum.....
	BOLTS, NUTS AND LOCK NUTS	Standard		
		Weight of zinc coating  g/m <sup>2</sup>	average.....	minimum.....
		Method of coating for bolt	<input type="checkbox"/> hot-dipped	<input type="checkbox"/> other (state).....
		Method of coating for nuts and lock nuts	<input type="checkbox"/> hot-dipped	<input type="checkbox"/> other (state).....
		Threads in nuts	<input type="checkbox"/> Tapped before galvanized	<input type="checkbox"/> Tapped after galvanized
		Retapping of nuts after galvanized	<input type="checkbox"/> yes	<input type="checkbox"/> no
	SPRING WASHERS	Standard		
		Method of coating	<input type="checkbox"/> hot-dipped	<input type="checkbox"/> other (state).....
		Weight of zinc coating  g/m <sup>2</sup>	Thickness < 4.76 mm	4.76 mm ≤ Thickness ≤ 6.35 mm
			average.....minimum.....	average.....minimum.....
	DESIGN	DESIGN METHOD	<input type="checkbox"/> Three-dimensional indeterminate method :  Computer program.....  Developed by.....	
			<input type="checkbox"/> Other method :  .....	

500 kV NAN - DEN CHAI (FROM KM.63 TO DEN CHAI) AND  
SECTIONALIZING OF 500 kV MAE MOH 3 - THA TAKO TO DEN  
CHAI SUBSTATION

PLEASE FILL OUT AND RETURN WITH YOUR PROPOSAL

<b>GALVANIZED STEEL TOWERS</b>				<b>Bidder</b>											
<b>PROPOSAL DATA</b>				<b>Item No.</b>											
TOWER TYPE	WEIGHTS IN KILOGRAMS														
	BASIC BODY	7.5 m. BODY EXTENSION	15.0 m. BODY EXTENSION	SINGLE LEG EXTENSION							STUB				
				1.5 m	3.0 m	4.5 m	6.0 m	7.5 m	9.0 m	10.5 m	CS	CIII	CIV	CV	PILE
DQV3															
DQV9(3)															
DQT20															
DQT40															
DQT60															
DQT90 (Tension)															
DQT90 (Terminal)															
DQTR (Tension)															
TOTAL ESTIMATED WEIGHT TO BE SUPPLIED FOR THIS PROJECT INCLUDING SPARE TOWERS															
Complete tower = Basic Body + Body Extension (if required) + 4 Leg Extensions.															

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CONDUCTOR HARDWARE ASSEMBLIES		Bidder				
		Item No.				
PROPOSAL DATA						
SUSPENSION ASSEMBLIES	Make and country of origin					
	Type of assembly	Assembly 3D	Assembly 8D			
	Reference Drawing No. and/or Catalog No.					
	Number of Insulators per assembly disc					
	Weight of assembly kg					
	Breaking strength of assembly kg					
	Maximum RIV at 1000 kHz $\mu$ V					
	Corona disappearance voltage (Line to ground/ at 4.5 m. from ground plane) kV					
DEAD-END ASSEMBLIES	Make and country of origin					
	Type of assembly	Assembly 13D	Assembly 13AD	Assembly 14D	Assembly 15D	
	Reference Drawing No. and/or Catalog No.					
	Number of Insulators per assembly disc					
	Weight of assembly kg					
	Breaking strength of assembly kg					
	Maximum RIV at 1000 kHz $\mu$ V					
	Corona disappearance voltage (Line to ground/ at 4.5 m. from ground plane) kV					
JUMPER SUPPORT ASSEMBLIES	Make and country of origin					
	Type of assembly	Assembly 17D				
	Reference Drawing No. and/or Catalog No.					
	Number of Insulators per assembly disc					
	Weight of assembly kg					
	Breaking strength of assembly kg					
	Maximum RIV at 1000 kHz $\mu$ V					
	Corona disappearance voltage (Line to ground/ at 4.5 m. from ground plane) kV					



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<b>SHIELD WIRE HARDWARE ASSEMBLIES</b>  <b>PROPOSAL DATA</b>		Bidder	
		Item No.	
SUSPENSION ASSEMBLIES	Make and country of origin		
	Type of assembly	Assembly 1	Assembly 2
	Reference Drawing No. and/or Catalog No.		
	Number of Insulators per assembly disc		
	Weight of assembly kg		
	Breaking strength of assembly kg		
DEAD-END ASSEMBLIES	Make and country of origin		
	Type of assembly	Assembly 11	Assembly 12
	Reference Drawing No. and/or Catalog No.		
	Number of Insulators per assembly disc		
	Weight of assembly kg		
	Breaking strength of assembly kg		

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INSULATOR DISC PROPOSAL DATA				Bidder		
				Item No.		
Make and country of origin						
Type of insulator <input checked="" type="checkbox"/> Porcelain <input type="checkbox"/> Glass Ball and socket				ANSI class 52-8	ANSI class 52-11	
Ref. Drawing No. and/or Catalog No.						
Disc outside diameter and tolerance mm						
Unit spacing mm						
Surface area of insulator	Top	cm <sup>2</sup>				
	Bottom	cm <sup>2</sup>				
Coupling type						
Leakage distance mm						
Projected area mm <sup>2</sup>						
Combined mechanical and electrical strength min.kg						
Mechanical impact strength min.m-kg						
Tension proof test load min.kg						
Time load min.kg				N/A	N/A	N/A
Low-frequency flashover voltage	Dry	kV				
	Wet	kV				
Critical impulse voltage	Positive	kV				
	Negative	kV				
Low-frequency puncture voltage kV						
Low-frequency test voltage, rms to ground kV						
Maximum RIV at 1,000 kHz μV						
Steep front wave impulse	Positive	min.kV/μs				
	Negative	min.kV/μs				
Unit weight of disc kg						
Material	Insulator shell					
	Cap and pin					
	Cotter key					
	Cement					
Galvanizing weight of coating		Cap.	min.g/m <sup>2</sup>			
		Pin.	min.g/m <sup>2</sup>			
Glaze or insulator shell color						
Quality Conformance Test Values	Combined mechanical and electrical test	$\bar{X}_L$	kg			
		$\bar{S}$	kg			
	Puncture test	$\bar{X}_L$	kV			
		$\bar{X}_U$	kV			
		$\bar{R}$	kV			
Withstand Voltage (Solid layer method IEC 60507)	ESDD 0.04 mg/cm <sup>2</sup>	kV				
	ESDD 0.06 mg/cm <sup>2</sup>	kV				
	ESDD 0.15 mg/cm <sup>2</sup>	kV				
	ESDD 0.25 mg/cm <sup>2</sup>	kV				

PLEASE FILL OUT AND RETURN WITH YOUR PROPOSAL

INSULATOR DISC PROPOSAL DATA				Bidder		
				Item No.		
Make and country of origin						
Type of insulator <input checked="" type="checkbox"/> Porcelain <input type="checkbox"/> Glass Ball and socket				ANSI class 54-2		
Ref. Drawing No. and/or Catalog No.						
Disc outside diameter and tolerance mm						
Unit spacing mm						
Surface area of insulator		Top	cm <sup>2</sup>			
		Bottom	cm <sup>2</sup>			
Coupling type						
Leakage distance mm						
Projected area mm <sup>2</sup>						
Combined mechanical and electrical strength min.kg						
Mechanical impact strength min.m-kg						
Tension proof test load min.kg						
Time load min.kg				N/A		
Low-frequency flashover voltage		Dry	kV			
		Wet	kV			
Critical impulse voltage		Positive	kV			
		Negative	kV			
Low-frequency puncture voltage kV						
Low-frequency test voltage, rms to ground kV						
Maximum RIV at 1,000 kHz μV						
Steep front wave impulse		Positive	min.kV/μs			
		Negative	min.kV/μs			
Unit weight of disc kg						
Material	Insulator shell					
	Cap and pin					
	Cotter key					
	Cement					
Galvanizing weight of coating		Cap.	min.g/m <sup>2</sup>			
		Pin.	min.g/m <sup>2</sup>			
Glaze or insulator shell color						
Quality Conformance Test Values	Combined mechanical and electrical test	$\bar{X}_L$	kg			
		$\bar{S}$	kg			
	Puncture test	$\bar{X}_L$	kV			
		$\bar{X}_U$	kV			
		$\bar{R}$	kV			
Withstand Voltage (Solid layer method IEC 60507)		ESDD 0.04 mg/cm <sup>2</sup>	kV			
		ESDD 0.06 mg/cm <sup>2</sup>	kV			
		ESDD 0.15 mg/cm <sup>2</sup>	kV			
		ESDD 0.25 mg/cm <sup>2</sup>	kV			

SHIELD WIRE PROPOSAL DATA		Bidder	
		Item No.	
Make and country of origin			
STRAINED WIRE	Size	3/8" EHS GSW	
	Sectional area	Nominal mm <sup>2</sup>	Calculated mm <sup>2</sup>
	Steel strand	Number	Diam mm
	Minimum breaking strength	kg	
	Outside diameter	mm	
	Standard weight	kg / km	
	Modulus of elasticity	Initial kg / mm <sup>2</sup>	Final kg / mm <sup>2</sup>
	Coefficient of linear expansion	per °C	
	Lay ratio and direction of lay		
COMPONENT WIRE	Diameter and tolerance	mm	
	Ultimate tensile strength, average	kg / mm <sup>2</sup>	
	Elongation in 610 mm.	%	
	Galvanizing weight of zinc coating		
OVERHEAD GROUND WIRE REEL	Reel designation		
	Reel capacity	m <sup>3</sup>	
	Flange diameter	mm	
	Drum diameters	mm	
	Reel width	Inside mm	Outside mm
	Arbor hole diameter	mm	
	Thickness of lagging wood	mm	
	Steel hub thickness	mm	
	Steel strab width and thickness	mm x mm	
	Number and size of flange fixing bolts		
	Kind of wood and preservation	Kind of wood	Preservation
	Length per reel and tolerance	m	
	Weight of each reel and tolerance	Net kg	Gross kg

PLEASE FILL OUT AND RETURN WITH YOUR PROPOSAL

500 kV NAN - DEN CHAI (FROM KM.63  
TO DEN CHAI) AND SECTIONALIZING  
OF 500 kV MAE MOH 3 - THA TAKO  
TO DEN CHAI SUBSTATION

SPACER-DAMPER / SPACER PROPOSAL DATA		Bidder	
		Item No.	Item No.
		Spacer damper for four-bundled conductor	
Maker and country of origin			
Ref. Drawing No. and / or Catalog No.			
Type of spacer-damper / spacer			
Suitable to use on conductor size			
Weight per set kg			
Design	Wind pressure on conductor kg / m <sup>2</sup>		
	Max. Conductor tension kg		
	Ruling span m		
	Total estimated quantity for this project set		
Movements	Longitudinal mm		
	Vertical mm		
	Transverse mm		
	Torsional degree		
Material	Frame / body		
	Clamp		
	Hub bushing		
	Bolt and nut		

SPACER-DAMPER / SPACER PROPOSAL DATA		Bidder	
		Item No.	Item No.
		Rigid Spacer for four-bundled conductor	Rigid Spacer for two- bundled conductor
Maker and country of origin			
Ref. Drawing No. and / or Catalog No.			
Type of spacer-damper / spacer			
Suitable to use on conductor size			
Weight per set kg			
Design	Wind pressure on conductor kg / m <sup>2</sup>		
	Max. Conductor tension kg		
	Ruling span m		
	Total estimated quantity for this project set		
Movements	Longitudinal mm		
	Vertical mm		
	Transverse mm		
	Torsional degree		
Material	Frame / body		
	Clamp		
	Hub bushing		
	Bolt and nut		

SPACER - DAMPER PROPOSAL DATA				Bidder :			
				Item No.			
				Conductor : 1272 MCM ACSR/GA			
PROPOSED QUANTITY OF SPACER - DAMPER FOR VARIOUS SPAN LENGTHS							
SPAN LENGTH (m)	SUSPENSIO N TO SUSPENSIO N TOWERS	SUSPENSIO N TO TENSION TOWERS	TENSION TO TENSION TOWERS	SPAN LENGTH (m)	SUSPENSIO N TO SUSPENSIO N TOWERS	SUSPENSIO N TO TENSION TOWERS	TENSION TO TENSION TOWERS
101 - 110				511 - 520			
111 - 120				521 - 530			
121 - 130				531 - 540			
131 - 140				541 - 550			
141 - 150				551 - 560			
151 - 160				561 - 570			
161 - 170				571 - 580			
171 - 180				581 - 590			
181 - 190				591 - 600			
191 - 200				601 - 610			
201 - 210				611 - 620			
211 - 220				621 - 630			
221 - 230				631 - 640			
231 - 240				641 - 650			
241 - 250				651 - 660			
251 - 260				661 - 670			
261 - 270				671 - 680			
271 - 280				681 - 690			
281 - 290				691 - 700			
291 - 300				701 - 710			
301 - 310				711 - 720			
311 - 320				721 - 730			
321 - 330				731 - 740			
331 - 340				741 - 750			
341 - 350				751 - 760			
351 - 360				761 - 770			
361 - 370				771 - 780			
371 - 380				781 - 790			
381 - 390				791 - 800			
391 - 400				801 - 810			
401 - 410				811 - 820			
411 - 420				821 - 830			
421 - 430				831 - 840			
431 - 440				841 - 850			
441 - 450				851 - 860			
451 - 460				861 - 870			
461 - 470				871 - 880			
471 - 480				881 - 890			
481 - 490				891 - 900			
491 - 500				901 - 910			
501 - 510				911 - 920			
TOTAL ESTIMATED QUANTITY TO BE SUPPLIED FOR THIS PROJECT INCLUDING SPARE QUANTITY			SPACER - DAMPERS				
			FOUR - BUNDLED				
			TERRAIN INFORMATION		0 % of Mountain in Transmission Line Distance		

<b>VIBRATION DAMPER</b>  <b>PROPOSAL DATA</b>	<b>Bidder</b>
	<b>Item No.</b>

**3/8" EHS GSW**

NUMBER AND LOCATION OF DAMPER (S) PER SPAN						
Span (m)	Type of span.					
	Suspension - Suspension		Suspension - Tension		Tension - Tension	
	Nos.	Location	Nos.	Location	Nos.	Location

**OPGW**

NUMBER AND LOCATION OF DAMPER (S) PER SPAN						
Span (m)	Type of span.					
	Suspension - Suspension		Suspension - Tension		Tension - Tension	
	Nos.	Location	Nos.	Location	Nos.	Location

**Notes**

1. Location is to specify the suspension end or the tension end of the span in which the vibration damper is installed.
2. The number of vibration dampers to be installed shall meet the requirements in the specifications.

PLEASE FILL OUT AND RETURN WITH YOUR PROPOSAL

500 kV NAN - DEN CHAI (FROM KM.63 TO DEN CHAI)  
AND SECTIONALIZING OF 500 kV MAE MOH 3 - THA  
TAKO TO DEN CHAI SUBSTATION

<b>VIBRATION DAMPER</b>  <b>PROPOSAL DATA</b>	<b>Bidder</b>		
	<b>Item No.</b>	<b>Item No.</b>	<b>Item No.</b>
	<b>3/8" EHS GSW</b>	<b>OPGW</b>	
Maker and country of origin			
Ref. Drawing No. and/or Catalog No.			
Type of vibration damper			
Conductor diameter mm			
Total weight of each damper kg			
Diameter of weights mm			
Length of weights mm			
Weight of weights kg			
Tolerance in weights %			
Slip strength of steel messenger wire kg			
Frequency response range of the damper c/s			
Peak natural resonant frequency of the damper			
a) Upper c/s			
b) Lower c/s			
Free loop length at m			
a) wind velocity m/s			
b) tension in conductor kg			
c) temperature °C			
Maximum safe bending amplitude peak to peak			
a) for the conductor mil			
b) for vibration damper clamp mil			
Maximum bending amplitude peak to peak for the conductor with damper (s) mil			



PLEASE FILL OUT AND RETURN WITH YOUR PROPOSAL

500 kV NAN - DEN CHAI (FROM KM.63 TO DEN CHAI) AND SECTIONALIZING OF 500 kV MAE MOH 3 - THA TAKO TO DEN CHAI SUBSTATION

<b>Overhead Ground Wire with Optical fiber (OPGW)</b>	Bidder
<b>PROPOSAL DATA</b>	Item No.
Make and country of origin	
OPGW Type	
ITU-T Recommendation	<input type="checkbox"/> G.652C <input type="checkbox"/> G.652D
Ultimate tensile strength	kg
Outside diameter	mm
Cross sectional area of conductor and steel tube	mm <sup>2</sup>
Number of strands	
Bending Radius	mm.
Maximum weight	kg/km
Maximum D.C. Resistance @ 20°	ohms/km
Length per reel and tolerance	m
Weight of each reel and tolerance	kg
Modules of elasticity	kg/mm <sup>2</sup>
Coefficient of linear expansion	per °C
Capacity fault current for 1 sec	(KA) <sup>2</sup>
Maximum creep 10 years	%
Optical Fiber Attenuation @ 1310 nm	dB/km
Optical Fiber Attenuation @ 1383 nm	dB/km
Optical Fiber Attenuation @ 1550 nm	dB/km
Optical Fiber Attenuation due to short circuit	dB/km
Dispersion coefficient @ 1310 nm	ps/(nm.km)
Dispersion coefficient @ 1383 nm	ps/(nm.km)
Dispersion coefficient @ 1550 nm	ps/(nm.km)
Aging loss	dB/km
Maximum splicing loss per point	dB
Number of fibers	core
Mode field diameter	μm
Cladding diameter	μm
Mode field Concentricity error	μm

PLEASE FILL OUT AND RETURN WITH YOUR PROPOSAL

500 kV NAN - DEN CHAI (FROM KM.63 TO DEN CHAI) AND SECTIONALIZING OF 500 kV MAE MOH 3  
- THA TAKO TO DEN CHAI SUBSTATION

Joint box, Fiberframe Termination Cabinet, Insulator		Bidder .....
PROPOSAL DATA		Item No. ....
Joint Box	Capacity conform to fiber core	<input type="checkbox"/> confirm <input type="checkbox"/> not confirm
	Max. closure splice capacity	.....cores
	Max.Number of tray per closure	.....Tray
	Splice capacity per tray	.....cores
	Type of Material of closure	.....
	Reinforcement sleeve for each core	<input type="checkbox"/> confirm <input type="checkbox"/> not confirm
	Manufacturer	
Fiberframe Termination Cabinet	Capacity conform to fiber core in one subrack	<input type="checkbox"/> confirm <input type="checkbox"/> not confirm
	Max.of capacity per subrack	.....cores
	Number of subrack	.....subrack
	Total of capacity	.....cores
	FC Through connector type with phospher bronze sleeve	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Subrack type	<input type="checkbox"/> Sliding drawer <input type="checkbox"/> .....
	Heat shrink splice protector	<input type="checkbox"/> confirm <input type="checkbox"/> not confirm
Insulator	Make /country	.....
	Catalogue supplied	<input type="checkbox"/> confirm <input type="checkbox"/> not confirm

PLEASE FILL OUT AND RETURN WITH YOUR PROPOSAL

PROPOSED LOCATIONS OF JOINT BOX			EXPECTED LENGTH OF OPGW TO BE USED		
AT  TOWER NO.	JOINT BOX		LENGTH BETWEEN  JOINT BOXES  (M)	ORDER REEL  LENGTH OF OPGW  (M)	WASTAGED  LENGTH  (M)
	2 WAY	3 WAY			
TOTAL					

(Use continuation sheets, if required)

PLEASE FILL OUT AND RETURN WITH YOUR PROPOSAL

500 kV NAN - DEN CHAI (FROM KM.63 TO DEN CHAI)  
AND SECTIONALIZING OF 500 kV MAE MOH 3 - THA  
TAKO TO DEN CHAI SUBSTATION

OPTICAL GROUND WIRE ASSEMBLIES		Bidder		
		Item No.		
PROPOSAL DATA				
SUSPENSION CLAMPS	Make and country of origin			
	Type	<input type="checkbox"/> Bolt type	<input type="checkbox"/> Preformed type	
	Ref. Drawing No. and / or catalog no.			
	Suspension Body			
	- Material			
	- Make and country of origin			
	Breaking strength of complete set kg			
Weight kg				
DEAD END CLAMPS	WITHOUT JOINT BOX	Make and country of origin		
		Type	<input type="checkbox"/> Bolt type	<input type="checkbox"/> Preformed type
		Ref. Drawing No. and / or catalog no.		
		Dead End Body		
		- Material		
		- Make and country of origin		
		Breaking strength of complete set kg		
	Weight kg			
	WITH JOINT BOX	Make and country of origin		
		Type	<input type="checkbox"/> Bolt type	<input type="checkbox"/> Preformed type
		Ref. Drawing No. and / or catalog no.		
		Dead End Body		
		- Material		
		- Make and country of origin		
Breaking strength of complete set kg				
Weight kg				

PLEASE FILL OUT AND RETURN WITH YOUR PROPOSAL

TOWER GROUNDING MATERIAL PROPOSAL DATA		Bidder	
		Item No.	
STANDARD GROUND ROD	Make and country of origin		
	Nominal size and length		
	Drawing No. and/or Catalog No.		
	Material		
	Method of production	<input type="checkbox"/> Molten-welded <input type="checkbox"/> Electro-deposited	
	Thickness of coating and tolerance mm		
	Outside diameter and tolerance mm		
	Length and tolerance mm		
	Weight per piece kg		
SECTIONAL GROUND ROD	Make and country of origin		
	Nominal size and length		
	Drawing No. and/or Catalog No.		
	Material		
	Method of production	<input type="checkbox"/> Molten-welded <input type="checkbox"/> Electro-deposited	
	Thickness of coating and tolerance mm		
	Outside diameter and tolerance mm		
	Length and tolerance mm		
	Drawing No. and/or Catalog No. of coupling		
	Weight per piece kg		
GROUND CONNECTOR	Make and country of origin		
	Drawing No. and/or Catalog No.		
	Type of connector		
	Material		
GROUND CONNECTOR	Make and country of origin		
	Drawing No. and/or Catalog No.		
	Type of connector		
	Material		
GROUND CONNECTOR	Make and country of origin		
	Drawing No. and/or Catalog No.		
	Type of connector		
	Material		
GROUND CONNECTING WIRE AND COUNTERPOISE	Make and country of origin		
	Nominal size		
	Materials		
	Conductivity %IACS		
	Length per reel and tolerance m		
	Weight per reel and tolerance kg		

PLEASE FILL OUT AND RETURN WITH YOUR PROPOSAL

FENCE/METAL OBJECT GROUNDING MATERIAL PROPOSAL DATA		Bidder
		Item No.
STANDARD GROUND ROD	Make and country of origin	
	Nominal size and length	
	Drawing No. and/or Catalog No.	
	Material	
	Method of production	<input type="checkbox"/> Molten-welded <input type="checkbox"/> Electro-deposited
	Thickness of coating and tolerance mm	
	Outside diameter and tolerance mm	
	Length and tolerance mm	
	Weight per piece kg	
SECTIONAL GROUND ROD	Make and country of origin	
	Nominal size and length	
	Drawing No. and/or Catalog No.	
	Material	
	Method of production	<input type="checkbox"/> Molten-welded <input type="checkbox"/> Electro-deposited
	Thickness of coating and tolerance mm	
	Outside diameter and tolerance mm	
	Length and tolerance mm	
	Drawing No. and/or Catalog No. of coupling	
	Weight per piece kg	
GROUND CONNECTOR	Make and country of origin	
	Drawing No. and/or Catalog No.	
	Type of connector	
	Material	
GROUND CONNECTOR	Make and country of origin	
	Drawing No. and/or Catalog No.	
	Type of connector	
	Material	
GROUND CONNECTOR	Make and country of origin	
	Drawing No. and/or Catalog No.	
	Type of connector	
	Material	
GROUND CONNECTING WIRE AND COUNTERPOISE	Make and country of origin	
	Nominal size	
	Materials	
	Conductivity %IACS	
	Length per reel and tolerance m	
	Weight per reel and tolerance kg	

**PROPOSAL DATA**  
**RECORD OF PREVIOUS WORK PERFORMED BY BIDDER**

\_\_\_\_\_  
(Name of Bidder or each firm of joint - venture)

No.	Work description	_____									
	Extent	<input type="checkbox"/>	Design	<input type="checkbox"/>	Supply	<input type="checkbox"/>	Construction	<input type="checkbox"/>	Others	_____	
	Site	_____						Owner	_____		
	Voltage, kV	No. of circuits			Line length, km.			Circuit distance, km.		No. of conductor/phase	
	Month and year of starting	Month and year of completion			Month and year of operation			Contract amount in equivalent U.S. \$			
	Method of stringing of subconductors	<input type="checkbox"/>	Individually			<input type="checkbox"/>	Simultaneously		<input type="checkbox"/>	Others _____	

No.	Work description	_____									
	Extent	<input type="checkbox"/>	Design	<input type="checkbox"/>	Supply	<input type="checkbox"/>	Construction	<input type="checkbox"/>	Others	_____	
	Site	_____						Owner	_____		
	Voltage, kV	No. of circuits			Line length, km.			Circuit distance, km.		No. of conductor/phase	
	Month and year of starting	Month and year of completion			Month and year of operation			Contract amount in equivalent U.S. \$			
	Method of stringing of subconductors	<input type="checkbox"/>	Individually			<input type="checkbox"/>	Simultaneously		<input type="checkbox"/>	Others _____	

(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORD OF WORK UNDER EXECUTION BY BIDDER**

\_\_\_\_\_  
(Name of Bidder or each firm of joint - venture)

No. _____	Work description _____	
	Site _____	Owner _____
	_____	_____
	Month and year of starting _____	Month and year of completion _____
	Extent of the Work _____	Contract amount in equivalent U.S.\$ _____
	_____	_____
	_____	_____
No. _____	Work description _____	
	Site _____	Owner _____
	_____	_____
	Month and year of starting _____	Month and year of completion _____
	Extent of the Work _____	Contract amount in equivalent U.S.\$ _____
	_____	_____
	_____	_____

(Use continuation sheets, if required)



**PROPOSAL DATA**

**LIST OF CONSTRUCTION EQUIPMENT TO BE USED, TOOLS, INSTRUMENTS AND MACHINERY**

<u>Names</u>	<u>Description</u>	<u>Specification and/or Model</u>	<u>Year in Service</u>	<u>Quantity</u>

**NOTE** : Please group equipment, tools, instruments and machinery into stringing, tower erection, foundation construction etc.

(Use continuation sheets, if required)

## LIST OF SUBCONTRACTORS FOR CONSTRUCTION & INSTALLATION

Name of Person, Firm,  
Partnership or Company  
Proposed as Subcontractor

Subcontract Amount in BahtThis image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. A large, light gray watermark with the word "DRAFT" is oriented diagonally from the bottom-left towards the top-right, centered over the page. There are no margins or other markings present.

- Part 2 - C21 -

**PROPOSAL DATA**  
**RECORD OF PREVIOUS WORK PERFORMED OR UNDER EXECUTION**  
**BY**  
**SUBCONTRACTOR**

\_\_\_\_\_  
(Name of Subcontractor)

<u>Item</u>	<u>Nature and Extent of Work</u>	<u>Client</u>	<u>Contract Amount Baht</u>	<u>Date of Contract</u>	<u>Date of Completion</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
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(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORD OF SUCCESSFUL OPERATION OR USE**  
**OF**  
**CONDUCTOR HARDWARE ASSEMBLIES**

\_\_\_\_\_  
(Name of Manufacturer)

No. \_\_\_\_\_ Name of Transmission Line \_\_\_\_\_

\_\_\_\_\_  
Voltage, kV

\_\_\_\_\_  
No. of circuits

\_\_\_\_\_  
No. of Conductor per phase

\_\_\_\_\_  
Line length, km.

Owner of the Transmission Line \_\_\_\_\_

\_\_\_\_\_  
Month and year of delivery completion

\_\_\_\_\_  
Month and year of starting of operation

(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORD OF SUCCESSFUL OPERATION OR USE**  
**OF**  
**INSULATORS**

\_\_\_\_\_  
(Name of Manufacturer)

No. \_\_\_\_\_ Name of Transmission Line \_\_\_\_\_

\_\_\_\_\_  
Voltage, kV

\_\_\_\_\_  
No. of circuits

\_\_\_\_\_  
Line length, km.

Owner of the Transmission Line \_\_\_\_\_

ANSI Class and Strength of Operating Insulators \_\_\_\_\_ Quantity \_\_\_\_\_ discs

\_\_\_\_\_  
Month and year of delivery completion

\_\_\_\_\_  
Month and year of starting of operation

(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORD OF SUCCESSFUL OPERATION OR USE**  
**OF**  
**SPACER DAMPERS**

\_\_\_\_\_  
(Name of Manufacturer)

No. \_\_\_\_\_ Name of Transmission Line \_\_\_\_\_

\_\_\_\_\_  
Voltage, kV

\_\_\_\_\_  
No. of circuits

\_\_\_\_\_  
Line length, km.

Owner of the Transmission Line \_\_\_\_\_

Conductor Size and stranding \_\_\_\_\_ No. of Conductor per phase \_\_\_\_\_

\_\_\_\_\_  
Month and year of delivery completion

\_\_\_\_\_  
Month and year of starting of operation

(Use continuation sheets, if required)

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(Use continuation sheets, if required)

**PROPOSAL DATA**

**SCHEDULE OF SHIPMENT OF LOCAL EQUIPMENT TO BE SUPPLIED UNDER THIS CONTRACT**

<u>Shipment No.</u>	<u>Shipping Point</u>	<u>Item Shipped</u>	<u>Ex-Works Estimated Value</u>	<u>Total Weight of Shipment-kg</u>	<u>Expected Date Ex-works Delivery</u>

(Use continuation sheets, if required)



**PROPOSAL DATA**

**SCHEDULE OF SHIPMENT OF IMPORTED EQUIPMENT TO BE SUPPLIED UNDER THIS CONTRACT**

<u>Shipment No.</u>	<u>Shipping Point</u>	<u>Item Shipped</u>	<u>CIF Bangkok Estimated Value</u>	<u>Total Weight of Shipment-kg</u>	<u>Expected Date of Arrival Bangkok Wharf</u>

(Use continuation sheets, if required)

**PROPOSAL DATA**

**SCHEDULE OF IMPORTED OPGW TO BE SUPPLIED UNDER THIS CONTRACT**

<u>Shipment No.</u>	<u>Shipping Point</u>	<u>Item Shipped</u>	<u>CIF Bangkok Estimated Value</u>	<u>Total Weight of Shipment-kg</u>	<u>Expected Date of Arrival Bangkok Wharf</u>

(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORDS OF EXPERIENCE**  
**OF**  
**OVERHEAD GROUND WIRE WITH OPTICAL FIBER**  
**(Name of Bidder/Joint Venture)**

<u>Item</u>	<u>Size of</u> <u>OPGW</u>	<u>Manufacturer</u>	<u>Quantity</u> <u>(km)</u>	<u>Utility/Purchaser</u>	<u>Name of project</u>	<u>Date of</u> <u>Contract</u>	<u>Date of Complete</u> <u>Installation</u>

(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORDS OF PAST SUCCESSFUL SUPPLY AND UNDER CURRENT COMMITMENT**  
**OF**  
**STEEL TOWERS**

\_\_\_\_\_  
 (Name of Manufacturer)

Fabricating Capacity \_\_\_\_\_ Tons/year

Galvanizing Capacity \_\_\_\_\_ Tons/year

<u>Item</u>	<u>Name of Transmission Line</u>	<u>Voltage</u> <u>kV</u>	<u>Weight</u> <u>Tons</u>	<u>Utility/Purchaser</u>	<u>Date of</u> <u>Contract</u>	<u>Date of</u> <u>Completion</u> <u>of Delivery</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORDS OF PAST SUCCESSFUL SUPPLY**  
**OF**  
**SHIELD WIRE**

\_\_\_\_\_  
(Name of Manufacturer)

<u>Item</u>	<u>Size and Stranding</u>	<u>Quantity</u> <u>km</u>	<u>Utility/Purchaser</u>	<u>Date of</u> <u>Contract</u>	<u>Date of</u> <u>Completion</u> <u>of Delivery</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORDS OF PAST SUCCESSFUL SUPPLY AND UNDER CURRENT COMMITMENT**  
**OF**  
**INSULATORS**

\_\_\_\_\_  
(Name of Manufacturer)

<u>Item</u>	<u>Name of Transmission Line</u>	<u>Voltage</u> <u>kV</u>	<u>ANSI Class</u>	<u>Others</u>	<u>Quantity</u> <u>Sets</u>	<u>Utility/Purchaser</u>	<u>Date of</u> <u>Contract</u>	<u>Date of</u> <u>Completion</u> <u>of Delivery</u>
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____	_____	_____	_____	_____

(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORDS OF PAST SUCCESSFUL SUPPLY AND UNDER CURRENT COMMITMENT**  
**OF**  
**SPACER DAMPERS**

\_\_\_\_\_  
(Name of Manufacturer)

<u>Item</u>	<u>Name of Transmission Line</u>	<u>Voltage</u> <u>kV</u>	<u>Line Length</u> <u>km</u>	<u>Quantity</u> <u>Sets</u>	<u>Utility/Purchaser</u>	<u>Date of</u> <u>Contract</u>	<u>Date of</u> <u>Completion</u> <u>of Delivery</u>
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(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORDS OF PAST SUCCESSFUL SUPPLY**  
**OF**  
**VIBRATION DAMPER**

\_\_\_\_\_  
(Name of Manufacturer)

<u>Item</u>	<u>Name of Transmission Line</u>	<u>Voltage</u> <u>kV</u>	<u>Conductor Size</u>	<u>Quantity</u> <u>Sets</u>	<u>Utility/Purchaser</u>	<u>Date of</u> <u>Contract</u>	<u>Date of</u> <u>Completion</u> <u>of Delivery</u>
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(Use continuation sheets, if required)



**PROPOSAL DATA**  
**RECORDS OF PAST SUCCESSFUL SUPPLY AND UNDER CURRENT COMMITMENT**  
**OF**  
**CONDUCTOR HARDWARE ASSEMBLIES**

\_\_\_\_\_  
(Name of Manufacturer)

<u>Item</u>	<u>Name of Transmission Line</u>	<u>Voltage</u> <u>kV</u>	<u>No. of subconductors</u> <u>per Bundle</u>	<u>Quantity</u> <u>Sets</u>	<u>Utility/Purchaser</u>	<u>Date of</u> <u>Contract</u>	<u>Date of</u> <u>Completion</u> <u>of Delivery</u>
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(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORDS OF PAST SUCCESSFUL SUPPLY**  
**OF**  
**SHIELD WIRE HARDWARE ASSEMBLIES**

\_\_\_\_\_  
(Name of Manufacturer)

<u>Item</u>	<u>Name of Transmission Line</u>	<u>Voltage</u> <u>kV</u>	<u>Wire Size</u>	<u>Quantity</u> <u>Sets</u>	<u>Utility/Purchaser</u>	<u>Date of</u> <u>Contract</u>	<u>Date of</u> <u>Completion</u> <u>of Delivery</u>
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(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORDS OF PAST SUCCESSFUL SUPPLY**  
**OF**  
**OPGW HARDWARE ASSEMBLIES**

\_\_\_\_\_  
(Name of Manufacturer)

<u>Item</u>	<u>Name of Transmission Line</u>	<u>Voltage</u> <u>kV</u>	<u>Wire Size</u>	<u>Quantity</u> <u>Sets</u>	<u>Utility/Purchaser</u>	<u>Date of</u> <u>Contract</u>	<u>Date of</u> <u>Completion</u> <u>of Delivery</u>
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(Use continuation sheets, if required)

**PROPOSAL DATA**  
**RECORDS OF PAST SUCCESSFUL SUPPLY**  
**OF**  
**VIBRATION DAMPER FOR OPGW**

\_\_\_\_\_  
(Name of Manufacturer)

<u>Item</u>	<u>Name of Transmission Line</u>	<u>Voltage</u> <u>kV</u>	<u>Wire Size</u>	<u>Quantity</u> <u>Sets</u>	<u>Utility/Purchaser</u>	<u>Date of</u> <u>Contract</u>	<u>Date of</u> <u>Completion</u> <u>of Delivery</u>
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(Use continuation sheets, if required)

**PROPOSAL DATA**

**LIST OF EQUIPMENT, TOOLS, INSTRUMENTS AND MACHINERY FOR INSTALLATION AND TESTING**

**OF**  
**OPGW**

<u>Item</u>	<u>Description</u>	<u>Specification and/or Model</u>	<u>Year in Service</u>	<u>Quantity</u>

**NOTE** : Please group equipment, tools, instruments and machinery into installation and testing.

(Use continuation sheets, if required)

**PROPOSAL DATA**  
**TEST PROGRAM AND FACILITIES**

**OPGW**

<u>Item</u>	<u>Type of Test</u>	<u>Manufacturer</u>	<u>Testing Firm</u>	<u>Test Location</u>	<u>Expected Date</u> <u>of Test</u>

(Use continuation sheets, if required)

**PROPOSAL DATA**  
**TEST PROGRAM AND FACILITIES**  
**OF**  
**HARDWARE ASSEMBLIES**

<u>Item</u>	<u>Type of Test</u>	<u>Manufacturer</u>	<u>Testing Firm</u>	<u>Test Location</u>	<u>Expected Date of Test</u>

(Use continuation sheets, if required)

[illegible]

*DRAFT*

(Use continuation sheets, if required)



[illegible][illegible][illegible]

**PROPOSAL DATA**  
**TEST PROGRAM AND FACILITIES**  
**OF**  
**VIBRATION DAMPER**

<u>Item</u>	<u>Type of Test</u>	<u>Manufacturer</u>	<u>Testing Firm</u>	<u>Test Location</u>	<u>Expected Date of Test</u>

(Use continuation sheets, if required)

**PROPOSAL DATA**

**NUMBER OF SUPERVISORS, ENGINEERS, FOREMAN, TECHNICIANS AND WORKMAN**

Description		Year																										Total
		Month																									Man-Month	
Supervisors	Stringing	Conductor																										
		OPGW																										
	Testing	OPGW																										
		Spacer-Dampers																										
	Subtotal																											
Engineer	Office																											
	Site																											
	Subtotal																											
Foreman	Foundation																											
	Erection or Installation of Equipment	Line																										
	Stringing	Conductor																										
		OPGW																										
	Subtotal																											
	Operator																											
Technician	Erection or Installation of Equipment	Line																										
	Stringing	Conductor																										
		OPGW																										
	Subtotal																											
Workman	Skilled																											
	Unskilled																											
	Subtotal																											
TOTAL MAN-MONTHS																												

## Statement of Compliance

Project : \_\_\_\_\_

## Electricity Generating Authority of Thailand

[illegible]

(Use continuation sheets, if required)

## PROPOSAL DATA

## Schedule of Design, Manufacture of Equipment and Construction

[illegible]

## DEVIATIONS

The undersigned Bidder confirms that the Proposal submitted by the Bidder

☐ complies with Specifications and commercial terms specified in the Bidding Documents.

☐ contains deviations from Specifications and/or commercial terms specified in the Bidding Documents as listed hereunder (Use continuation sheets, if required):

DRAFT

Confirmed :

Firm :

By :

Title :

**SECTION D**  
**CONTRACT**

**CONTRACT**  
**FOR**  
**SUPPLY AND CONSTRUCTION OF TRANSMISSION LINES**  
**500 KV NAN - DEN CHAI (FROM KM. 63 TO DEN CHAI)**  
**AND SECTIONALIZING OF 500 KV MAE MOH 3 - THA TAKO**  
**TO DEN CHAI SUBSTATION**  
**TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND**  
**UTTARADIT PROVINCES FOR POWER PURCHASE**  
**FROM LAO PDR PROJECTS**

No. \_\_\_\_\_

This Contract is executed and delivered this \_\_\_\_\_ day of \_\_\_\_\_, B.E. \_\_\_\_\_ (A.D. \_\_\_\_\_) between

**ELECTRICITY GENERATING AUTHORITY OF THAILAND**

represented by \_\_\_\_\_, of said Authority, hereinafter called "EGAT", and

**CONTRACTOR**

represented by \_\_\_\_\_, age \_\_\_\_\_ years, nationality \_\_\_\_\_, hereinafter called "the Contractor".

EGAT and the Contractor mutually agree as follows:

**D-1. Contract Documents**

The following documents attached to this Contract are incorporated and made a part of this Contract, as though fully written out and set forth herein:

**Volume I : Terms and Conditions**

Data Sheet

Section A. Invitation to Bid

Section B. Instructions to Bidders

Section C. Contract Price, Price Schedules, Completion Date of Work and Proposal Data

Section D. Contract

Section E. General Conditions

Section F. Special Conditions

Section G. Local Conditions



Section H. Attachments

1. Attachment No. 1 : List of Equipment to be Furnished by EGAT
2. Attachment No. 2 : List of Equipment to be Dismantled by the Contractor
3. Attachment No. 3 : Requirements for Dismantling Work and Conditions of Sale of Dismantled Equipment

Section I. Supplemental Notices :

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Section J. Changes :

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**Volume II : Drawings and Data**

**Volume III : - Specifications No. L-500 kV (Revision 2) Construction of 500 kV Transmission Line, April 2001**

**- Amendment No. 1 to Specifications No. L-500 kV (Revision 1)**

**- Amendment No. 2 (Rev. 2, April 2016) to Specifications No. L-500 kV (Revision 1)**

**- Amendment No. 4 (Rev. 1, April 2025) to Specifications No. L-500 kV (Revision 1)**

**Volume IV : Communication Specification for Composite Overhead Ground Wire with Optical Fiber (OPGW) (OD. 11.4 mm.)**

All of the foregoing documents are referred to herein as the Contract Documents. They are also incorporated into this Contract and made a part hereof all codes, designations, standards, standard specifications and similar Equipment which are referred to in the Specifications and Special Conditions.

**D-2. Acceptance of Proposal**

EGAT has accepted the proposal of the Contractor to furnish Equipment, design, test, construct, and install the transmission line in accordance with and subject to all the terms and conditions of these Contract Documents.

**D-3. Agreement**

The Contractor agrees to furnish Equipment, and to perform the design, test, construction, and installation services, and EGAT agrees to pay for the Equipment and services in accordance with the terms and conditions as described in this Contract.

**D-4. Obligation of Contractor**

The Contractor agrees to perform well and faithfully all the services and to furnish all of the Equipment described in these Contract Documents, and to supply and provide all Equipment, labor and other things requisite for or incidental to the said Work.

**D-5. Obligation of EGAT**

EGAT agrees, subject to the terms and conditions of these Contract Documents, to pay to the Contractor the amount shown, and at the rates and times and in the manner set forth in these Contract Documents.

**D-6. Mutual Obligations**

EGAT and the Contractor mutually agree to perform, fulfill, abide by, and submit to any and all of the provisions and requirements and all matters and things contained or expressed in, or reasonably to be inferred from these Contract Documents.

**D-7. Deposit of Performance Security**

The Contractor agrees to deposit with EGAT an acceptable performance security in accordance with the Contract Documents.

**D-8. Assignment**

The Contract or any part thereof shall not be assigned or pledged without the written consent of EGAT, nor shall the Contractor assign or pledge any money due, or to become due, to him hereunder, without the prior written consent of EGAT.

**D-9. Notices**

All notices called for by the terms of this Contract shall be effective only at the time of receipt thereof and only when received by the parties to whom they are addressed at the following addresses:

EGAT : Governor  
Electricity Generating Authority of Thailand  
Bangkruai, Nonthaburi 11130,  
Thailand

Contractor : \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

All notices called for by the terms of this Contract shall be in the form of registered letters or *letter submitted electronically or electronic mails (E-mails)* in the English language.

**D-10. Integration**

EGAT and the Contractor agree that this Contract, including the Contract Documents, expresses all of the agreements, understandings, promises, and covenants of the parties, and that it integrates, combines, and supersedes all prior and contemporaneous negotiations, understandings, and agreements, whether written or oral, and that no modification or alteration of this Contract shall be valid or binding on either party, unless expressed in writing and executed with the same formality as this Contract, except as may otherwise be specifically provided in this Contract.

**D-11. Counterpart**

This Contract is executed in two (2) identical counterparts: one (1) for EGAT and one (1) for the Contractor.

**ELECTRICITY GENERATING AUTHORITY  
OF THAILAND**

**CONTRACTOR :**

By \_\_\_\_\_  
( )

By \_\_\_\_\_  
( )

Witness :

Witness :

By \_\_\_\_\_  
( )

By \_\_\_\_\_  
( )

**SECTION E**  
**GENERAL CONDITIONS**

## **GENERAL CONDITIONS**

### **E-1. Definitions**

Whenever the following terms are used in the Contract Documents, they shall have the following meanings :

- EGAT : The Electricity Generating Authority of Thailand, having its Head Office at Nonthaburi, Thailand, and its authorized representative or representatives
- Engineer : Firm or company assigned by EGAT to provide engineering consulting or construction management services in support of EGAT
- Bidder : Any person or firm or company or joint venture of firms submitting a bid to EGAT for furnishing the services and Equipment described in the Contract Documents, in response to this Invitation to Bid
- Option (if any) : Work and/or Equipment to be quoted by Bidders, which EGAT reserves the right to accept or omit in whole or in part
- Contractor : Any person or firm or company or joint venture of firms whose bid has been accepted by EGAT for furnishing of the services and Equipment described in the Contract Documents including the Contractor's appointed representatives, successors and assigns of such persons
- Subcontractor : Any person or firm or company (other than the Contractor) to whom any part of the Contract has been sublet, with the consent of EGAT, by the Contractor
- Contract : The agreement between EGAT and the Contractor, and all Appendices and Schedules thereto including Invitation to Bid, Instructions to Bidders, Proposal, General Conditions, Special Conditions, Local Conditions, Specifications, Drawings, Supplemental Notices and any other documents referred to in, or connected with the Contract, even though said documents are issued after execution of the Contract

Contract Price	:	The sum specified in Section C which is inclusive of VAT (if any) subject to such additions thereto or deductions therefrom as may be made under the provisions hereinafter contained
Equipment	:	Machinery, apparatus, materials, goods, including accessories and spare parts to be supplied under the Contract and specifically described in the Specifications
Work	:	Equipment to be supplied, and all the various classes of work services to be executed, whether temporary or permanent, under the Contract
Construction and Installation Work	:	Work to be executed for investigation, preparation of site, installation of the Equipment at the site, construction of tower foundations including supply of cement, aggregate and reinforcement, furnishing and installation of piles, and all other associated or incidental work for the completion of the work under the Contract
Thai Port	:	Commercial ports in Thailand including but not limited to Bangkok Port, Laem Chabang Port, Sriracha Harbour Port, Siam Seaport, Maptaphut Port, Songkhla Port, Phuket Harbour Port or Suvarnabhumi Airport, as the case may be
Bangkok Port	:	Bangkok Wharf (Klong Toey Port) and all other commercial ports in Bangkok Metropolitan area
Year	:	Calendar year
Month	:	Calendar month
Day	:	Calendar day

## **E-2. Intent of Contract Documents**

All of the Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all. In the case of any discrepancy between any of the Contract Documents, or any defective description or ambiguity, the matter shall be promptly submitted to EGAT, which shall promptly make a determination in writing. Any adjustment by the Contractor without this determination shall be at the Contractor's own risk and expense. In all cases of discrepancy, defective description, or ambiguities, the interpretation given by EGAT shall be binding on the Contractor, subject to the provisions of Article E-34. Dispute Resolution, included in these General Conditions.

**E-3. Applicable Law and Legal Jurisdiction**

The applicable law of this Contract shall be the law in force in the Kingdom of Thailand. Should there be any ambiguity or discrepancy rising out or in connection with the Contract Documents, the interpretation thereof shall be made in accordance with Thai laws. Any litigations between the parties that may arise out of or in connection with this Contract or the breach or termination thereof or the performance of work thereunder shall be submitted to the Court of Thailand for decision, except as may be otherwise specifically provided in these Contract documents.

**E-4. Statutory Requirements**

Throughout the continuance of the Contract, the Contractor shall conform to all laws of the Kingdom of Thailand, and to all regulations, by-laws, ordinances, or orders made thereunder, and to the lawful requirements of any public, municipal, or other authority, in any way affecting or applicable to the Contractor or its operations.

**E-5. Patents and Copyrights**

The Contractor shall indemnify and hold EGAT, its officers, agents, and employees harmless against and from liability of any nature or kind, including costs and expenses for or on account of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article, or appliance manufactured, delivered, or used in carrying out the Work under the Contract. All drawings and the information contained therein as well as the use of any process, material or equipment developed in the course of carrying out the Work under the Contract shall become the property of EGAT where EGAT shall have the right to use any or all of them for any purpose either for present or future projects. For the avoidance of doubt, none of them will be used solely for any commercial benefit which is not related to EGAT work.

**E-6. Subcontracts**

The Contractor shall not assign or transfer the Contract or any part thereof or any benefit or interest therein or thereunder or any monies due or to become due under this Contract to any other person or persons.

The Contractor shall not be allowed to subcontract the whole of the Work under this Contract. Subcontracting of any part of the Work shall be subject to the prior written consent of EGAT. Such consent, if given, shall not relieve the Contractor from full and entire responsibility under this Contract.

If the Contractor desires to subcontract any part or parts of the Work called for by the Contract, he shall notify EGAT in writing to that effect and shall state in such notice the nature and extent of the part or parts of the Work called for by the Contract proposed to be subcontracted and name of the person proposed as Subcontractor. Unless and until written approval is given by EGAT, which shall not be unreasonably withheld, the Contractor shall not subcontract any part of the Work. All requirements specified in these Contract Documents shall be applicable to Subcontractors also.

No contractual relation shall exist between EGAT and the Subcontractors and the Subcontractors are not to enjoy any privileges conferred on the Contractor by this Contract.

Any Work done by any Subcontractor who has not been approved by EGAT shall be subject to rejection or stoppage of Work by EGAT. In such case the Contractor cannot claim delay or request for time extension of the Contract completion date and/or make financial claim to EGAT.

#### **E-7. Contractor's Employees**

With respect to the Contractor's employee(s) hiring for execution of the Construction and Installation Work, the Contractor shall comply with labour laws, Social Security Act, Workmen's Compensation Act, including related rules and regulations in force in the Kingdom of Thailand.

In execution of the Construction and Installation Work in accordance with the Contract, the Contractor shall employ Thai national personnel, selecting these personnel on the basis of competency, efficiency and skill. Also not less than ten (10) per cent of the employees but at least one (1) employee, for each particular field of work required, i.e. Arc Welder, Gas Welder, Electrician (Building), Refrigeration and Air Conditioning Mechanic, Carpenter (Construction), Plumber, Brick Layer and Plasterer, shall have the Occupational Skill Standard Certificates issued by the Department of Skill Development of Ministry of Labour or shall graduate with a Vocational Certificate, Vocational Diploma, Diploma of Technical Education or with equivalent certificate/diploma from any educational institute certified for official employment by the Office of Civil Service Commission. In addition, any employee who works in the field of Electrician (Building) shall also be required to obtain the License Occupation Certification issued by the Department of Skill Development of Ministry of Labour.

The Contractor shall submit list of such employees with names, number and level of skill accompanying with documentary evidence to EGAT before commencement of the Work. EGAT shall have the right to investigate the provision enforced at all time and the Contractor shall provide all necessary assistance required in this connection.



The Contractor, however, shall have the right to employ specialized foreign personnel for key positions. Resumes describing the experience of the Contractor's employees shall be submitted to EGAT for consideration. The proposed date of arrival of the person in Thailand shall accompany the submission of his resume to EGAT and shall be submitted to EGAT at least thirty (30) Days prior to the proposed arrival date of the person. Following EGAT's approval of the person for employment to perform Contract Work, EGAT will issue to the Contractor an invitation letter, which shall include the arrival date of the person in Thailand, to enable the Contractor to submit applications for a visa and work permit. No foreign person shall be allowed to work before he has received a work permit.

EGAT shall have the right at any time to require the Contractor to remove from the Work any of the Contractor's employees who, in the opinion of EGAT, are incompetent, careless, insubordinate, disorderly, or dangerous; or whose continued employment is contrary to the best interest of EGAT, or whose conduct has brought them in conflict with authorities. The right of EGAT to remove Contractor's employees shall be exercised only upon written notice to the Contractor by EGAT. All expenses associated with removal and replacement of such employees shall be paid by the Contractor.

#### **E-8. Business Permit License**

According to the announcement of Foreign Business Act B.E. 2542 (1999), the Contractor who has foreigners working for him in the Kingdom of Thailand under this Contract is required to obtain a Business Permit License issued by Department of Business Development, Ministry of Commerce in order to apply for Work Permit License for the foreigners. The supporting letter for the Contractor's Business Permit License will be issued by EGAT upon receipt of written request. Work permits for Contractor's personnel shall be obtained by the Contractor at his own responsibility and account. The Contractor under Foreign Business Act B.E. 2542 (1999) is not allowed to work until he has received the Business Permit License.

Notwithstanding the foregoing, according to the announcement of Ministerial Regulation Prescribing Service Business Not Subject to Application for Foreign Business Permission, B.E. 2560 (2017), Service business having a state enterprise under the Budgetary Procedure Act, B.E. 2543 (2000), as a contractual party shall be exempted from obtaining a Foreign Business Permit License under the Act.

## **E-9. Insurance**

The Contractor shall take out insurance for the Work under the Contract without limiting his obligations, liabilities or responsibilities. Any amounts not insured or not recovered from the insurers shall be borne by the Contractor. The following insurance coverage shall be obtained and maintained in effect:

1. Compulsory and Voluntary Automobile (comprehensive) Liability Insurance.
2. Transportation Insurance for all Equipment, machinery and supplies provided by the Contractor both in Thailand and elsewhere. The sum insured shall be:
  - a. 110 (one hundred and ten) per cent of the CIF Thai Port invoiced value for all foreign supply.
  - b. the total value of the ex-works Contract Price for all local supply.

For the Equipment to be supplied by EGAT, the sum insured for Transportation Insurance shall be the total value of the Equipment informed by EGAT.

3. Contract Work Insurance (CAR – the Building and Civil Engineering Work, Machinery Erection, and Third Party Liability Sections) for protection of the Work and the construction plant and temporary Works, and all Equipment or other things intended to form, but not yet forming, part of the Work up until the date of issuance of the Provisional Acceptance Certificate.

The sum insured in the currency or currencies in which the price has been stated in the price schedules shall be the total value of Contract Price (except costs of spare parts, test of Equipment and supply of service of vehicle) plus the cost of Equipment to be supplied by EGAT.

The terms of coverage shall include at least the following clauses:

### **Marine Insurance**

- Institute cargo clauses (A),
- Institute war clauses, and
- Institute strikes clauses.

### **Contract Work Insurance**

- Cross liability clause,
- Principal's employees and representatives clause,
- Strikes, riot and commotion clause,
- Extended maintenance clause,

Existing property clause or Principal's property clause

Escalation clause, and

Expediting clause

For the extension or the improvement of the existing substation(s) of Transmission System Project, the terms of the coverage shall also include the following clauses:

Offsite Storage clause

Third Party Liability in respect of Existing Underground Cable or Pipelines clause or Special Conditions Concerning Underground Cables, Pipes and Other Facilities clause

Vibration clause

The above insurance policies shall be effected with a reputable and acceptable insurance company. The Contract Work Insurance shall be effected with Thai insurance company or international insurance company operating in Thailand as listed and approved by Office of Insurance Commission in terms and conditions approved by EGAT. The beneficiary of the insurance under items 2 and 3 shall be EGAT and the Contractor.

The Contractor shall take out the insurance policies as above expressed and submit the policies to EGAT within the time as follows:-

1. Thirty (30) Days before delivery of the vehicle(s) for Compulsory and Voluntary Automobile (comprehensive) Liability Insurance.
2. Thirty (30) Days after signing the Contract for Contract Work Insurance and sixty (60) Days after signing the Contract for Transportation Insurance.

The policies shall remain valid until the issuance of the Provisional Acceptance Certificate. EGAT reserves the right to demand the Contractor to modify and amend the above policies as necessary to protect the interests of EGAT.

#### **E-10. Export Charges**

All tariffs, duties and other taxes or charges levied by the country of origin on the Equipment required for the performance of this Contract shall be paid by the Contractor, and such expenses shall be included in the cost of Equipment.

#### **E-11. Import Duty and Taxes**

EGAT will only pay import duty and taxes including value added tax on each item price of Equipment as specified in the price schedule of the Contract which will be assessed by the Customs Department at the port of entry on all Equipment imported under the name of EGAT into the Kingdom of Thailand to be permanently used and installed in the Work under this Contract except import duty and taxes including value added tax for raw materials and components imported under the name of the Contractor to be fabricated or manufactured in Thailand which shall have to be paid by the Contractor.

The Contractor shall arrange the necessary permits and licenses for the importation of such Equipment into the Kingdom of Thailand. The cost of such procuring shall be borne by the Contractor and shall be included in the Contract Price.

EGAT will not pay import duty and taxes on either the personal effects of the Contractor's employees, such as personal articles, household furnishings and appliances, and goods of any kind imported for the personal use of the Contractor's employees whether imported by an employee or by the Contractor, or in respect of food, tobacco, liquor and other commissary goods imported by the Contractor or by his employees.

EGAT will not pay import duty and taxes including value added tax on equipment, tools, instruments and machinery imported by the Contractor for purpose of carrying out the Work under this Contract. All processes of importation shall be arranged by the Contractor.

Construction equipment, tools, instruments and machinery which are certified by the Contractor that they are required for construction, installation, test and commissioning of the Work at the site and they are intended for re-exportation can be temporarily exempted from import duty and taxes including value added tax. All construction equipment thereof shall be imported under the name of the Contractor and be in accordance with the rules and regulations of the Customs Department of the Kingdom of Thailand.

EGAT will assist the Contractor for such temporary exemption of import duty and taxes including value added tax by issuing a letter confirming such temporary import. Import duty and taxes including value added tax for the temporarily imported construction equipment shall be paid by the Contractor to the Customs Department before re-exportation at the rate to be specified by the Customs Department at the time of importation for the whole period they have been imported into the Kingdom of Thailand. Temporary importation of the equipment is subject to approval of the Customs Department and the deposit of a bond with the Customs Department in the amount to be notified by the Customs Department is required. All costs for submission of information and data if required by the Customs Department and the cost of provision of the bond shall be borne by the Contractor.

In view of numerous advantages, the ATA Carnet system or other systems may be arranged for shipment of the said temporarily imported equipment by the Contractor (if required). Any charge incurred and/or any liability shall be borne by the Contractor.

#### **E-12. Value Added Tax**

Pursuant to the Revenue Code of Thailand, EGAT shall be responsible and pay when due for the value added tax imposed on the supply of Equipment, including local transportation (if any) and/or on the provision of services under this Contract. EGAT shall in no case be responsible for the value added tax collectible on any payment made by the Contractor under any subcontract or under any other circumstances and the Contractor shall comply with the rules and regulations of the Revenue Code of Thailand.

In case there is any change on the rate of value added tax imposed by the Government of Thailand, the amount of value added tax comprised in the Contract Price shall be adjusted to reflect such change, provided that the price of the Work shall remain unchanged.

#### **E-13. Income and Other Taxes**

Income and other taxes assessed or collected by the Government of Thailand or any subdivision thereof, or any municipality therein on the Contractor and his employees shall be under the responsibility and account of the Contractor.

In accordance with the Revenue Code of Thailand, should the payment under this Contract be subject to income tax, and the withholding tax of any kind is required to be withheld by EGAT, such withholding tax shall be deducted by EGAT from each payment and EGAT will be responsible to remit such tax to the Revenue Department of Thailand on behalf of the Contractor. In case any payment being made through the letter of credit or being made directly from foreign source whereby the withholding tax cannot be deducted from payment, the Contractor is required to immediately inform EGAT once each such payment is made to the Contractor, and the withholding tax of which will be paid from EGAT own fund to the Revenue Department in the same manner as aforesaid. Such withholding tax amount as advanced by EGAT on behalf of the Contractor shall be reimbursed by the Contractor to EGAT within the period of time fixed by EGAT.

In case the Contractor considers that the transaction under this Contract is exempted from income tax of Thailand (under any circumstance), the Contractor shall submit, together with his proposal, a statement detailing such exemption and the valid documentary evidence. Should EGAT rely on the statement so submitted, no deduction for withholding tax shall be made from payment. However, if the tax authority of Thailand determines that such exemption is not applicable, the Contractor shall then be responsible for the amount(s) equal to the withholding tax, plus the amount(s) of tax exceeding those of withholding tax, including the surcharge and/or penalties imposed on EGAT and the Contractor. The responsibility and liability of the Contractor as provided in the preceding sentence shall survive termination of the Contract.

If the Contractor fails to immediately inform EGAT of the payment as required under this second paragraph preventing EGAT from remitting the withholding tax to the Revenue Department within seven (7) days from the end of the month in which such payment is made, or fails to pay and/or reimburse EGAT for any amount required under this Article within the period of time fixed by EGAT, such period not to be shorter than fifteen (15) days from the date of EGAT's notice for payment, EGAT has the right to claim directly from the Contractor or from Performance Security or Maintenance Security, as the case may be, or deduct or setoff from any money due to the Contractor under this Contract for the outstanding amount, surcharge and/or penalty (if any) together with interest at the rate of Minimum Overdraft Rate (MOR) plus two (2) per cent calculated from the due date up to the date the payment is made in full.

EGAT will proceed with the tax matters under the Contract by relying on the information and document submitted by the Contractor in relation to the Bidder's status and tax liability. If the Revenue Department of Thailand differently determines the status and tax liability, the Contractor shall be responsible and liable for any cost and expense, penalty, and/or surcharge incurred and/or imposed on him and EGAT in relation thereto.

#### **E-14 Fees and Duties**

Any and all immigration fees, stamp duties, and other fees assessed or collected by the Government of Thailand, or by any subdivision thereof, or by any municipality therein, on this Contract, on the Contractor and/or his personnel shall be paid by the Contractor. Any taxes collectible under this Contract, other than those stipulated in this Contract, shall be at the responsibility and account of the Contractor.

The stamp duty for any service contract (Construction, Hire of Work, Consultancy Service, Transportation, Supervisor, etc.) with the Contract value of the service portion lower than baht 200,000.- is required to be affixed by the Contractor on the original copy and the counterpart of the Contract. In case the value of the service portion is baht 200,000.- and over, payment of such stamp duty by the Contractor shall be made in cash to the Revenue Department of Thailand or its authorized subdistrict offices. In either case, the stamp duty is required to be affixed or paid, as the case may be, within fifteen (15) Days after the date of Contract execution, otherwise the Contractor shall be liable to pay for any and all penalties imposed for the delay as required by law.

The Contract value of the service portion to be calculated for stamp duty under this provision shall be the price excluding VAT.

For a foreign Contractor who has no representative in Thailand, EGAT will, upon receipt of written request from the Contractor, affix or pay for stamp duties from EGAT's own fund on behalf of the Contractor, the Contractor is therefore required to

reimburse EGAT for such stamp duties plus any and all penalties imposed by law for delay, if such delay is due to Contractor's failure to make written request to EGAT as aforesaid within a reasonable period of time.

If the Contractor fails to reimburse EGAT for any and all amount as required under this Article within the period of time fixed by EGAT, such period not to be shorter than fifteen (15) Days from the date of EGAT's notice for payment, EGAT has the right to claim directly from the Contractor or claim from Performance Security or Maintenance Security, as the case may be, or deduct or setoff from any and all money due to the Contractor under this Contract for the outstanding amount together with interest at the rate of Minimum Overdraft Rate (MOR) plus two (2) per cent calculated from the due date up to the date the payment is made in full.

#### **E-15. Performance Security**

The Contractor shall, at the time of execution of the Contract, deposit with EGAT a performance security for the due and proper performance of this Contract in the amount of ten (10) per cent, round up to the nearest whole number, of the total Contract Price. The performance security shall insure payment of any obligations, penalty, damages, liquidated damages, or expenses for which the Contractor may become liable to EGAT.

The amount of the performance security shall be adjusted or the Contractor may deposit a new performance security in the amount of ten (10) per cent, round up to the nearest whole number, of the additional Contract Price to cover the Contractor's obligation in case the Contract Price is increased due to change of the Work under the Article E-23. Changes and Extra or Omitted Work.

The performance security shall be in the form of a cash deposit, or a cashier cheque issued by a local bank, or a bank guarantee or letter of guarantee issued only by a local bank or an acceptable financial institution in Thailand, or by a foreign bank counter-guaranteed by a local bank, and made payable to EGAT in the same currency as that of the Contract. In case of a cash deposit or a cashier cheque, only Thai baht portion of the Contract Price can be made. EGAT may at any time, upon application by the Contractor, approve the substitution for any performance security held under this Article by other performance security on such terms and conditions as may be approved by EGAT. The Contractor shall bear the cost of the performance security.

The conditions of the guarantor's obligations in the performance security shall include, inter alia, the following :

- a. The guarantor shall unconditionally guarantee, as primary obligor and not as surety merely, payment of any obligations, damages, liquidated damages, penalty, or expenses for which the Contractor may become liable to EGAT.
- b. No extension of time, change in, addition to, or other modification of the terms of the Contract or Work to be performed thereunder, or of the Specifications or other Contract Documents shall in anyway release the guarantor from any liability under the performance security, and the guarantor shall thereby waive notice of any such extension of time, change, addition or modification.
- c. The performance security shall be valid and remain in full effect from the date of execution of the Contract until the issuance of the Provisional Acceptance Certificate by EGAT against submission of the Maintenance Security accepted by EGAT.

Unless and until an official receipt is issued in respect to a security deposit, EGAT will not recognize or accept any such deposit as fulfilling the requirements of this Article. Failure to deposit a security at the time specified above in this Article or such extended time as may be approved by EGAT shall be a breach of this Contract and EGAT is entitled to terminate the Contract or suspend any payment for Work performed until the performance security has been accepted by EGAT. EGAT shall not be liable for any losses, expenses and/or damages resulting from such payment suspension.

If any security furnished under this Article becomes unacceptable to EGAT, or, if any guarantor fails to furnish reports as to guarantor's financial condition from time to time, as requested by EGAT, the Contractor shall promptly furnish such additional or alternative security as may be required by EGAT from time to time to protect the interests of EGAT, up to an amount equal to the amount of the security.

In the event of any default or breach of this Contract on the part of the Contractor, EGAT may convert into money any security which does not consist of money, and the proceeds shall be deemed to be a cash deposit under this Article. EGAT shall not be liable for any costs, expenses and/or loss resulting from the conversion of any performance security deposit into money as herein provided.

The performance security, in case of a bank guarantee, or letter of guarantee, shall be in conformity with the specimen acceptable to EGAT as shown herein at the end of these General Conditions.



## **E-16. Inspection and Tests**

All Equipment furnished and all Work performed under this Contract shall be subject to inspection by EGAT or EGAT's authorized representatives at its option while such Work is in progress to ascertain that the completed Work will comply in all respects with the standards and requirements set forth in the Contract Documents. Notwithstanding such inspection, the Contractor will be responsible for the acceptability of the finished Work.

EGAT or EGAT's representatives shall at all times have access to the Work whenever it is in preparation or progress and the Contractor shall provide proper facilities for such access and shall furnish promptly, without additional charge, all facilities, labor and material reasonably needed for safe and convenient inspection by EGAT or EGAT's representatives. The Contractor shall notify at least two (2) Months in advance when and where the Equipment and the Work will be available for each inspection and test. Any expense incurred by EGAT or EGAT's representatives to inspect the Equipment and the Work or to attend the test caused by false call of the Contractor for inspection and tests shall be borne by the Contractor.

If any Work should be covered up, or otherwise made inaccessible, without the approval of EGAT, it shall, if required by EGAT, be uncovered and made accessible for examination. Any such cover, which is required in the finished Work, shall be restored to EGAT's satisfaction at the Contractor's expense.

The acceptance of any Work or Equipment covered by these Contract Documents, or the making or waiving of any inspection or witnessing of any tests shall in no way relieve the Contractor of full responsibility for the quality, character and satisfactory operation and performance of the complete Work, and every part of it, as outlined in these Contract Documents, nor shall it prejudice or affect the rights of EGAT as set forth in the Contract.

Unless otherwise specifically provided in the Contract, the expenses directly required for all labor, tools, instruments, other materials and Equipment necessary for performance of the tests shall be borne by the Contractor.

- a. Shop Tests. The Contractor shall at his own expense conduct shop tests in accordance with the Specifications and submit the results of the tests to EGAT within fifteen (15) Days after completion of the tests. EGAT reserves the right to inspect all Equipment either in person or via video conference during its manufacture or fabrication and prior to its preparation for shipment, to inspect its packing when ready for shipment, and to witness any or all tests.

In the event the results of the tests do not satisfy the requirements of the Specifications or the guaranteed performance, the Contractor shall rectify the

Equipment until satisfactory results are obtained and shall conduct all necessary retests at his own expense.

Any delay in delivery or completion due to the retest shall not constitute a release of the Contractor from his responsibility for delay. Any expense incurred by EGAT in attending these retests shall be borne by the Contractor.

EGAT reserves the right to send one or more of EGAT's employees, not as inspectors, to the Contractor's plant to witness the fabrication, assembly and testing of any or all parts of the Equipment being furnished under this Contract. Travelling expenses and per diem of such employee or employees shall be borne by EGAT.

- b. Field Tests. During construction and installation, the Contractor shall at his own expense conduct field tests in accordance with the Specifications for the Work. The Contractor shall have his installation supervisor present at these tests.

Should any one of the results of the filed tests prescribed in the Specifications fail to satisfy the requirements of the said Specifications, or if the test does not satisfy the guaranteed performance, EGAT may at its own volition and option refuse provisional acceptance of the Equipment and/or Construction and Installation and demand the Work to be repaired or replaced or make provisional acceptance upon reduction in the Contract Price. The Contractor, however, shall be entitled to request a retest within a period of time from the test designated by EGAT, in which event all costs of the retest shall be borne by the Contractor.

#### **E-17. Preparation for Shipment and/or Delivery**

The Contractor shall submit shipment and/or delivery schedule for EGAT's approval at least thirty (30) Days in advance before each shipment and/or delivery is made. No shipment and/or delivery shall be made prior to EGAT's approval which will be notified to the Contractor within fifteen (15) Days after receipt of the said shipment and/or delivery schedule.

All imported and local Equipment to be delivered under this Contract shall be satisfactorily packaged in such a manner to protect them from damage during transportation and for outdoor storage at the site in hot, wet, humid and dusty conditions. In addition, all imported Equipment shall also be satisfactorily packaged for moist tropical ocean shipment. Where necessary, heavy parts shall be mounted on skids so that cable slings for handling can readily be attached. Where it is unsafe to apply external slings to a package, attached slings shall be provided and shall project through the package so that attachment can readily be made.

In order to keep the damage to non-water proof Equipment during the transportation at minimum level, the Contractor and/or supplier is required to put an umbrella mark on every package of the Equipment.

The cost incurred for repair or replacement of any damages to the Equipment due to improper packaging shall be at the Contractor's expense.

Each individual package or crate shall be clearly and plainly tagged or marked for identification, as follows :

EGAT, THAILAND

NAME OF PROJECT : \_\_\_\_\_  
CONTRACT NO. : \_\_\_\_\_  
CASE NO. : \_\_\_\_\_  
ITEM NO. : \_\_\_\_\_  
DESCRIPTION : \_\_\_\_\_

In addition to this, the following instructions shall be observed :

- a. Each box, crate, case, bundle or piece of loose Equipment shipped must show the following information clearly marked on its body :
  1. Gross weight in kilograms
  2. Net weight in kilograms
  3. Dimensions in centimeters
- b. All boxes, crates, cases, bundles, loose pieces, etc. must be marked consecutively from No. 1 upward throughout all shipments to completion of the order without repeating the same number.
- c. The packing list must indicate whether shipment is partial or complete, and shall incorporate the following information on each container, etc., according to its individual shipping number:
  1. Export case markings
  2. Case number
  3. Gross weight and net weight in kilograms
  4. Dimensions in centimeters
  5. Complete description of Equipment

#### **E-18. Clearance and Weight Limitations**

The largest unloading facilities at Bangkok Wharf are 35 metric tons cranes. Lifts heavier than 35 tons will have to be handled by ocean freighter on-board lifting equipment. Ocean freighters of the 10,000 tons class regularly calling at Bangkok Wharf have off-loading capacities to handle 50 tons.

The largest unloading facilities at Laem Chabang Port are 30 metric ton cranes. Lifts heavier than 30 tons will have to be handled by ocean freighter on-board lifting equipment.

Generally, unloading at Thai Port and highway transportation are subject to the following limitations :-

Dimensions	Limitations		
	Unloading at Bangkok Wharf		Unloading at Laem Chabang Port/ Maptaphut Port
Weight (tons)	60.0	>60.0-135.0	120.0
Width (meters)	3.5	3.5	4.5
Length (meters)	10.0	10.0	25.0
Height from Loading Platform (meters)	3.7	4.0	4.0

The Contractor shall therefore exercise due care to pack the Equipment to meet the above transport limitations.

#### **E-19. Shipment**

The Contractor shall be responsible for transportation of the Equipment under the Contract from point of origin to the Work site. The customs clearance and the expenses related thereto including godown rent, landing and handling charges, etc. at the port of entry shall be the responsibility of the Contractor. The shipping documents shall be submitted to EGAT within the time specified under Article E-20. Documents Required for Each Shipment.

Shipment of Equipment from port of embarkation to the final port of discharge shall be effected by using Thai vessels through the sea freight forwarder appointed

by the Contractor. The Contractor is required to notify EGAT of the name of the sea freight forwarder one (1) week prior to shipment.

According to the regulations of *the Maritime Promotion Division*, Marine Department (as amended from time to time), shipments by non-Thai vessels can be made after receipt of permission granted by *the Maritime Promotion Division*, Marine Department as requested by the Contractor.

The Contractor is, therefore, required to immediately contact *the Maritime Promotion Division*, Marine Department for such permission with supporting documents of the case thereof for arrangement of the permission in advance.

The Contractor shall follow all other regulations stated in the Mercantile Marine Promotion Act B.E. 2521 and the regulations of *the Maritime Promotion Division*, Marine Department (as amended from time to time).

The Contractor shall be liable for any and all costs and expenses, losses and/or damages suffered by EGAT as a result of the Contractor's failure to comply with such regulations.

For more information, the Contractor may contact *the Maritime Promotion Division, Marine Department at telephone No. 66 2233 1311-8 extension 387 and facsimile No. 66 2639 4778, <https://maritimepromotion.md.go.th/>.*

All imported Equipment shall be shipped on Conference Line or on seaworthy oceangoing vessels which are members or associate members of the International Association of Classification Societies (IACS) and ISM Code certified vessels. Vessels over fifteen (15) Years of age shall not be used for shipment under this Contract unless they :

- a) have been used for the carriage of general cargo on an established and regular pattern of trading between a range of specified ports, and do not exceed twenty-five (25) Years of age, or
- b) were constructed as containerships, vehicle carriers or double-skin open-hatch gantry crane vessels (OHGCs) and have been continuously used as such on an established and regular pattern of trading between a range of specified ports, and do not exceed thirty (30) Years of age.

Shipment shall be made under deck except for such Equipment which for dimensional reasons cannot be stowed in the vessel's hold. In case Equipment cannot be stowed in the vessel's hold, permission shall be obtained from EGAT prior to loading such Equipment on deck. Such approval shall not be unreasonably withheld. The Contractor shall in any case be responsible for proper packing for protection of such Equipment loaded on deck of the vessel. Shipment of all Equipment by dry cargo

container will be accepted, but all the incidental expense shall be borne by the Contractor.

For shipment of Equipment under this Contract, transshipment is allowed.

Any delicate Equipment, materials, instruments and tools including but not limited to computers, electronic parts, etc., shall be shipped by airfreight. The Contractor shall be responsible for proper packing for protection of such Equipment loaded on cargo hold of the aircraft.

Air freight shipment to airport of disembarkation in Thailand shall be effected through the air freight forwarder appointed by the Contractor. The Contractor is required to notify EGAT of the name of the air freight forwarder one (1) week prior to shipment.

Transportation from the port to the site, unloading and handling at the site shall also be under the responsibility of the Contractor.

The Contractor shall be responsible for delivery of all Equipment and/or materials manufactured and/or purchased in the Kingdom of Thailand to the site. Unloading and handling at the site is also under responsibility of the Contractor.

#### **E-20. Documents Required for Each Shipment**

##### **a. For Seafreight**

For accounting procedure, the Contractor is required to send to EGAT the bill of lading, invoice and master packing list immediately by ***letter submitted electronically or by electronic mail (E-mail)*** but not later than three (3) Days after the Equipment are actually loaded free on board (FOB Vessel) at the port of shipment.

In case payment is effected through letter of credit, two (2) original negotiable and three (3) copies of non-negotiable bill of lading, five (5) original signed invoices and three (3) copies of packing list shall be submitted to EGAT through the Bank within the time as specified in the letter of credit.

##### **b. For Airfreight**

For accounting procedure, the Contractor is required to send to EGAT the air waybill, invoice and master packing list immediately by ***letter submitted electronically or by electronic mail (E-mail)*** but not later than three (3) Days after the Equipment are actually loaded on the air carrier at the airport of departure.

In case payment is effected through letter of credit, two (2) copies of air waybill, five (5) signed invoices and three (3) copies of packing lists shall be submitted to EGAT through the Bank within the time as specified in the letter of credit.

To act in accordance with the rules and regulations of the Customs Department of the Kingdom of Thailand, the following declarations, other than regular statements, have to be made in English language in the invoice for any transaction concluded with EGAT :

- a. Country from which Equipment is purchased as well as country of origin; if the Equipment is produced in the country or group of countries where there are trade agreements between such country or group of countries and the Kingdom of Thailand, preferential treatment on import duty and taxes for importation of the Equipment is required;
- b. Electricity Generating Authority of Thailand as consignee and Thailand as consigning country;
- c. Date and Number of Contract;
- d. Name of Project;
- e. Marking and numbers, as well as gross weight and volume;
- f. Details of Equipment, i.e. names, kinds, qualities, quantities, net weights and other particulars as available for each type including trademarks or other symbols of such Equipment. If there are no trademarks or symbols, the invoice shall indicate "no trademarks" or "no symbols", as the case may be;
- g. Selling price or value of Equipment per unit expressed in the type of currency under transaction and representing actual price or value of Equipment as stated in the price schedules or price breakdown as the case may be.

If the Contractor fails to specify the price or value of Equipment according to the Contract in the invoice prepared for shipment, the Contractor shall be held responsible for the following:

1. In case of over value or price of Equipment stated in the invoice, the Contractor shall be responsible for reimbursement to EGAT for the import duty and taxes (excluding value added tax) collected by the Customs Department on the over value or price of Equipment as well as interest. Value added tax imposed in connection thereto shall be EGAT's responsibility. The Contractor shall also refund to EGAT the amount of over value payment as well as interest. The interest to be applied under this Article shall be Minimum Overdraft Rate announced by Krung Thai Bank plus two (2) (MOR+2) percent calculated from the date of EGAT's payment of the over value payment, import duty and taxes until the date of the Contractor's settlement of the same in full.
2. In case of under value or price of Equipment stated in the invoice, the Contractor shall be responsible for reimbursement to EGAT the surcharges imposed on additional import duty and taxes at the rate currently established by the Customs Department as well as interest (if any).

The Contractor shall, at the time of shipment, prepare and submit a certificate of origin(s) for the Equipment required as per point a. above together with the invoice and other shipping documents for EGAT to obtain the benefit from preferential treatment on import duty and taxes for importation of the Equipment from the country or group of countries where there are trade agreements between such country or group of countries and Thailand. For each shipment, all items of Equipment requiring certificate of origin shall be included in only one (1) certificate of origin except as otherwise specified in any trade agreement. The trade agreements shall include but not be limited to the following:

1. Common Effective Preferential Tariff (CEPT) Scheme for the ASEAN Free Trade Area (AFTA);
2. Agreement between the Kingdom of Thailand and Japan for an Economic Partnership; and
3. Agreement between the Government of the Kingdom of Thailand and the Government of the People's Republic of China on Accelerated Tariff Elimination under the Early Harvest Programme of the Framework Agreement on Comprehensive Economic Cooperation between ASEAN and China.

If the Contractor advises EGAT in writing before shipment that it is unable to provide a certificate of origin to EGAT, the Contractor shall be responsible for all costs incurred including but not limited to reimbursement to EGAT for the excess amount of the import duty and taxes (except value added tax) paid by EGAT to Customs Department.

Further to the above, if the Contractor delays to provide a proper certificate of origin to EGAT, the Contractor shall be responsible for all costs incurred including but not limited to reimbursement to EGAT for the storage charges and the interest on the excess amount of import duty and taxes (except value added tax) paid by EGAT to the Customs Department at the rate of Minimum Overdraft Rate announced by Krung Thai Bank plus two (2) (MOR+2) percent calculated from the date of EGAT's payment of import duty and taxes up to the date of receipt of the excess amount of import duty and taxes refund from the Customs Department.

However, if the Contractor fails to provide such proper certificate to EGAT, the Contractor shall be responsible for all costs incurred including but not limited to reimbursement to EGAT for the storage charges and the excess amount of the import duty and taxes (except value added tax) paid by EGAT to the Customs Department as well as interest on the said excess amount of import duty and taxes at the rate of Minimum Overdraft Rate announced by Krung Thai Bank plus two (2) (MOR+2) percent calculated from the date of EGAT's payment of import duty and taxes up to the date of acknowledgement that the certificate cannot be issued in conformity with requirement of the Free Trade Agreement.

The Contractor is also required to study the existing trade agreements and any new trade agreement between the Kingdom of Thailand and a country or group of countries published in the website of Customs Department ([www.customs.go.th](http://www.customs.go.th)) and/or Ministry of Commerce ([www.moc.go.th](http://www.moc.go.th)), and ask for more information from EGAT in order that EGAT can obtain the benefit from preferential treatment on import duty and taxes for



importation of the Equipment from the country or group of countries where there are trade agreements between such country or group of countries and the Kingdom of Thailand.

Fullest conformity with the requirements of the Customs Department of the Kingdom of Thailand mentioned above is essential as a condition precedent.

Unless by force majeure, failure to furnish EGAT with these shipping documents and the certificate of origin within the specified period and strictly in accordance with conditions stipulated above thereby causing impossibility of making prompt customs clearance of the Equipment from Thai Port, the Contractor shall, upon receipt of the EGAT's notice, reimburse EGAT for go down rent / storage charge and other expenses arising from or in consequence of the nonconformity with the above specified requirement.

**E-21. Transfer of Title**

The title of ownership for the Equipment furnished under this Contract shall be passed to EGAT at the time the Equipment is actually loaded onto the vessel at the port of shipment, or into charge of the air carrier at the port of departure, or at the time the Equipment is actually delivered ex-works and the Contractor's statement or delivery order confirming delivery of the Equipment ex-works has been certified by EGAT's representative. However, this transfer of title shall not be construed as an acceptance of the Equipment. The Contractor shall continue to be responsible for the quality and performance of the Equipment, and for their compliance with the Specifications as well as any loss, theft or damage of the Equipment during the course of execution of the Contract, until final acceptance of the Work by EGAT and the fulfillment of the guarantee provision of the Contract.

**E-22. Variations in Quantities**

The Quantities listed in the Bid Price Schedule are not guaranteed to be exact but represent the estimated quantities under this Contract. The Contractor hereby agrees to make no claim for anticipated profits, or for alleged losses, because of any difference between the quantities actually furnished and erected and the estimated quantities as indicated in these Contract Documents provided that the total change in Contract Price shall not be more than fifteen (15) per cent of the original Contract Price.

**E-23. Changes and Extra or Omitted Work**

EGAT may at any time authorize changes in, additions to, or deductions from the Work to be performed or Equipment to be furnished under the Contract. Changes, additions or deductions shall be authorized only by written notice served by EGAT upon the Contractor, and such notice shall be treated as an integral part of the

Contract. Adjustments, if any, in the amounts to be paid to the Contractor by reason of any such change, addition or deduction shall be determined by one or more of the following methods :

- a. By unit price contained in the Price Schedule.
- b. By a supplemental schedule of prices contained in the Contractor's proposal.
- c. By an acceptable lump sum or unit price proposal from the Contractor.
- d. On a cost-plus limited basis not to exceed a specific limit. A cost-plus limited basis is defined as the cost of Equipment, labor, and insurance, plus fifteen (15) per cent of the said cost to cover superintendence, general expenses and profit.

No claim for an addition to the Contract Price shall be valid unless authorized as described in this Article. If the parties are unable to agree to the method to be employed in determining adjustments in the Contract Price, the method shall be determined by EGAT.

#### **E-24. Termination and Suspension of Contract**

EGAT may, at any time by written notice to the Contractor, suspend the whole or any portion of the Work under this Contract. Upon EGAT's approval of the Contractor's written request, compensation to the Contractor for such suspension will be allowed only for the direct cost occurred at the construction site. Such compensation is subject to the fact that during the period of being suspended, the Contractor cannot perform any Work under this Contract and has to be idle or has the least volume of work under this Contract to perform. The total amount of compensation shall in no case exceed twenty (20) per cent of the cost of such portion of work suspended by EGAT. Notwithstanding anything contrary contained in Article E-34, Dispute Resolution, in the event that the Contractor is not satisfied with the compensation determined by EGAT, the Contractor may submit this matter to EGAT's Governor for decision. The decision of EGAT's Governor shall be final and binding.

If the suspension of the Work is due to the fault or negligence on the part of the Contractor or his subcontractors or force majeure, no additional payment shall be made by EGAT and the Contractor shall have no right to claim for such damages.

EGAT shall have the right at its sole discretion to terminate or cancel the Contract in whole or in part in any of the following events :

- a. If EGAT deems that the Work or a part thereof cannot be completed by the Contractor within the period or extended period provided by the Contract on account of any reason which is attributable to the Contractor, or

- b. The Contractor, without reasonable excuse, has failed to commence the Work according to the agreed work schedule specified in the Contract, or
- c. The Contractor is not executing the Work in accordance with the orders and/or instructions of EGAT and is persistently and flagrantly neglecting to carry out his obligations under the Contract, or
- d. The Contractor has acted unlawfully in the performance of the Contract, or
- e. The Contractor has become bankrupt or insolvent.

In the event EGAT terminates or cancels the Contract in whole or in part, EGAT may after giving fourteen (14) Days prior notice in writing, enter the site of the Work and the Contractor shall not obstruct EGAT's action.

In the event EGAT shall make entrance or cause the Contractor to withdraw from the work site in accordance with this Article, EGAT shall have no responsibility under the Contract for payment to the Contractor until the Work is completed and the expenses incurred for completion of the Work, the amount of damages for delay in completion and any and all other expenses borne by EGAT have been ascertained.

The Contractor shall be obligated to pay to EGAT the amounts required by EGAT or other contractors for the additional costs of installation and administration resulting from non-fulfillment of the Contract by the Contractor and the damages for breach of Contract by the Contractor.

#### **E-25. Default and Forfeiture of Contract**

If the Contractor should :-

- a. Fail to carry out the Work in accordance with this Contract ; or
- b. Refuse or fail to prosecute the Work or any separable part of it with such diligence as will ensure its completion within the time specified in this Contract or any authorized variation of those times or fail to complete said Work within such time ; or
- c. Commit any breach of or fail to comply with or observe the provisions of this Contract or any of them; or
- d. Notify EGAT in writing that he is unable or unwilling to complete the Work; or
- e. Become insolvent or bankrupt or make an arrangement or composition with his creditors or, being a corporation, go into liquidation whether compulsory or voluntary (except for the purpose of reorganization); or

- f. By himself or by any person on his behalf, give or offer any money or benefit or forbearance to any employee of EGAT and/or any employee of the Engineer who has duties or responsibilities in connection with the acceptance of the Proposal or the making of this Contract or the execution of the Work ;

then, in any of such events, the Contractor shall be in default under this Contract and the Contractor shall be liable to EGAT for losses and/or damages, including but not limited to increased construction costs and increased administrative costs, suffered by EGAT as a result of the Contractor's default. EGAT shall have the right to suspend payment under this Contract until the default has been rectified and have the right to deduct from any money due or becoming due to the Contractor under this Contract, and/or from any performance security deposited, or, after use of the property and materials of the Contractor for completion of the Work, as provided in this Contract, such property and materials may be sold and the proceeds shall be applied to any remaining obligations of the Contractor. EGAT may exercise any or all of the foregoing rights to the extent necessary to satisfy the full amount of any obligations of the Contractor, and if any balance remains owing to EGAT, it may be collected by suit against the Contractor in any court of competent jurisdiction.

#### **E-26. Limitation of Liability**

- a) The Contractor's total liability to EGAT for losses and/or damages resulting in any way from breach and/or termination of the Contract shall not exceed the total Contract Price.
- b) Neither party shall be liable to the other party for any indirect, incidental, consequential or punitive damages as a result of the performance or non performance of the obligations imposed pursuant to this Contract.

#### **E-27. Indemnification by the Contractor**

The Contractor shall fully indemnify and hold harmless EGAT and its employees and officers from and against any and all suit, actions or administrative proceedings, claims (including any claim for copyright or patent infringement), demands, losses, costs, expenses (including attorney's fees and expenses) and damages of whatsoever nature except breach or default, in respect of death or injury of any person or loss of or damage to any property caused by any act or omission of the Contractor or the Contractor's own officers, directors, agents, employees, Contractors or Subcontractors arising in any manner whatsoever, except any injury, death or property damage caused by the negligence of EGAT, its contractors, employees, officers or agents.

#### **E-28. Vesting of Contract in Receiver**

If the Contractor shall compound with his creditors, or shall become bankrupt or insolvent, or carry on business under a receiver, or become incapable from any cause whatsoever of carrying out the Work, any such receiver or any person in whom by law the Contract shall become vested, shall forthwith give notice to EGAT of the fact that the Contract has become vested in it and shall take all reasonable steps to carry on the Work at a rate fulfilling the Contract requirements. Thereupon, if EGAT so desires during the period of one (1) Month from the date when the Contract becomes so vested in it, such receiver or other such person as aforesaid shall have the option of carrying out the Contract. In the event of the Work being stopped, this option shall be opened only for a period of fourteen (14) Days from the stoppage date. In the event of the receiver or such other person not electing to carry out the Contract or EGAT not approving the carrying out of the Contract by the receiver, the Contractor shall then be in default and EGAT may proceed in accordance with Article E-25. Default and Forfeiture of Contract.

#### **E-29. Rights to Properties**

Except for the Contractor's personal belongings, the work performed either wholly or partly by the Contractor under the Contract, and site office and facilities, any equipment, materials, tools, spare parts, drawings, designs, documents i.e., books, records, reports, manuals and etc., provided, supplied, created, or developed, wholly or partly, by the Contractor or its suppliers or provided by EGAT to the Contractor for the work under this Contract (hereinafter called "EGAT's Properties") shall, at all time, be the sole property of EGAT, notwithstanding that those EGAT's Properties are in possession of the Contractor or EGAT. The Contractor agrees that any possession by the Contractor of any of EGAT's Properties is the possession only for and on behalf of EGAT.

Once the Contract is terminated for whatever reasons, the Contractor shall promptly return those EGAT's Properties to EGAT in good condition (ordinary wear and tear is excepted) and EGAT has the right to promptly take possession or to remove those EGAT's Properties into EGAT's possession. If after the date of termination, the Contractor continues to retain those EGAT's Properties or obstructs EGAT from taking possession, it shall be considered as an unlawful possession by the Contractor and the Contractor shall be liable for any losses and/or damages incurred by EGAT arising therefrom.

### **E-30. Force Majeure**

The Contractor shall not be in default under this Contract because of any delays in delivery or in completion of the Work on the separable parts thereof, which such delays are caused by force majeure; Provided, that the Contractor shall notify EGAT in writing of the cause of any such delay within fifteen (15) Days after the end of the event which results in the delay. Upon receipt of any such notice of delay, EGAT will promptly ascertain the facts and the extent of the delay and will extend the time for completing the Work when, in the opinion of EGAT, the delay is caused by force majeure or the findings of fact to justify an extension. EGAT's decision shall be binding on the Contractor, subject to the provisions of Article E-34. Dispute Resolution, included in these General Conditions.

"Force Majeure" shall be defined as any event, the happening or pernicious results of which could not be prevented eventhough a person against whom it happened or threatened to happen were to take such appropriate care as might be expected from him in his situation. (Normal rains, normal inundation, dearth of water, the overturning or sinking of barges in canals, rivers or streams and similar events shall not be considered as force majeure.)

### **E-31. Extension of Time**

If, by reason of any of the following:

- a. Negligence or default on the part of EGAT or its agents
- b. Failure on part of other Contractors
- c. Extra Work
- d. Deviation from the Specifications or suspension of the Work at the written direction of EGAT for reasons beyond the control of the Contractor
- e. Any unpreventable accident
- f. War, insurrection, riot or civil commotion or delay caused thereby
- g. Strikes, not caused by the Contractor's management
- h. Unusual inclemency of the weather
- i. Lawful order of civil or military authorities
- j. Unusually natural calamities, Acts of God
- k. Any other unforeseen circumstances beyond the Contractor's control

the Contractor claims that he has been unduly delayed in the progress of the Work, he shall make written request to EGAT for an extension of time for completion of the Work or any portion of it. A request for extension of time for completion of the Work or any portion of it shall include a critical path or similar analysis.

Should EGAT consider such claim to be valid, it will grant such extension of time as may seem reasonable to EGAT for completion of the Work or any portion of it, without thereby prejudicing or in any manner affecting the validity of the Contract. No extension of time will be granted unless the Contractor makes the written request within fifteen (15) Days after the end of the event which results in the delay.

Other than claiming an extension of time for completion of the Work, the Contractor shall not have any further recourse or claim against EGAT, nor shall he have any right of action against EGAT for loss or damage suffered by reason of such delay.

#### **E-32. Failure to Meet Requirements**

EGAT shall have the right to require the Contractor to make any changes in the Equipment or Work covered by this Contract which may be necessary, in the opinion of EGAT, to make the Equipment or Work conform to the requirements of the Contract Documents, without additional cost to EGAT. Any defects in the Equipment or workmanship or other failure to meet the requirements of the Contract, including errors and omissions on the part of the Contractor, which are disclosed prior to final payment or prior to provisional acceptance by EGAT, or after completion of all tests, whichever occurs at the later date, shall, if so directed by EGAT, be corrected, replaced or reinstalled promptly by the Contractor at the expense of the Contractor.

Any latent defects not disclosed prior to the date of final payment or prior to provisional acceptance or after completion of all tests, whichever occurs at the later date, but disclosed within the guarantee period as specified in item a of Article F-17. Maintenance Guarantee, shall be corrected, replaced or reinstalled promptly by the Contractor at the expense of the Contractor, except that the cost of import duty and taxes for foreign supplied Equipment will be borne by EGAT.

The Contractor shall extend the provisions of his liability to cover all repaired and replacement parts furnished under this Article as follows : -

#### **For 115 kV and 230 kV Transmission Lines with Single and Twin-Bundled Conductor per Phase**

For a new period of one (1) Year beginning from the day immediately following the date of completion of such repair or replacement.

**For 230 kV and 500 kV Transmission Lines with Four-Bundled Conductor per Phase**

(1) All the Work except Conductor Hardware Assemblies, Insulators and Spacer Dampers for Conductor

- Any malfunctioning and/or defect found within the guarantee period : For a new period of one (1) Year from the day immediately following the date of completion such repair and replacement

(2) Conductor Hardware Assemblies, Insulators and Spacer Dampers for Conductor

- Any malfunctioning and/or defect found within the first Year of guarantee period : For a new period of three (3) Years from the day immediately following the date of completion of such repair and replacement
- Any malfunctioning and/or defect found within the second Year of guarantee period : For a new period of two (2) Years from the day immediately following the date of completion of such repair and replacement
- Any malfunctioning and/or defect found within the third Year of guarantee period : For a new period of one (1) Year from the day immediately following the date of completion of such repair and replacement

The Contractor shall, if required by EGAT in writing, search under the directions of EGAT for the cause of any defect, imperfection or fault appearing during the progress of the Work or in the period of maintenance guarantee. Unless such defect, imperfection or fault shall be one for which the Contractor is liable under the Contract, the cost of the work carried out by the Contractor in searching as aforesaid shall be borne by EGAT. If such defect, imperfection or fault shall be one for which the Contractor is liable under the Contract, the cost of the work carried out in searching as aforesaid shall be borne by the Contractor and he shall in such case repair, rectify and make good such defect, imperfection or fault at his own expense.



**E-33. Operation or Use of Unsatisfactory Equipment**

If the operation or use of the Equipment proves to be unsatisfactory to EGAT, EGAT shall have the right to operate and use such Equipment until they can be taken out of service for correction by the Contractor of such latent defects, errors, or omissions and for replacement in whole or in part, if correction is unsuccessful or infeasible. The period of such operation or use shall not exceed one (1) Year from the day immediately following the date of provisional acceptance of the Work by EGAT.

**E-34. Dispute Resolution**

Any dispute arising out of or in connection with this Contract, interpretation, breach, or termination thereof shall be settled by amicable discussion between authorized representatives of each Party. Either Party may at any time send a written notice to the other Party requesting for an appointment of authorized representative for a settlement of any dispute hereunder. The Parties agree to make diligent and good faith attempt to resolve such dispute in an equitable manner. If the authorized representatives of both Parties are unable to resolve such dispute within 30 Days after commencement of the discussion for dispute resolution or other extended period of time as mutually agreed by both Parties, either Party may file a lawsuit to the court having jurisdiction in Thailand for settlement of such dispute. Each Party agrees that the final court judgment shall be conclusive and binding upon the Parties.

Pending decision of the court, both Parties shall continue to perform their respective obligations under this Contract.

**E-35. Language and Numbers**

All drawings, designs, specifications, manuals, nameplates, markings, operating instructions, statements, schedules, notices, documents and all written communications between EGAT and the Contractor, concerning this Contract, shall be in the English language and in the metric system of weights and measures unless otherwise specified.

**E-36. Advance Payment Security**

The Contractor shall deposit with EGAT Advance Payment Securities in the same currency and equivalent amounts as the advance payment being made by EGAT under Article F-10. Payment.

The advance payment securities shall be in the form of a bank guarantee or letter of guarantee issued only by a local bank or an acceptable financial institution in Thailand, or by a foreign bank counter-guaranteed by a local bank, and made payable to EGAT in the same currency as that of the Contract. EGAT may at any time, upon application by the Contractor, approve the substitution for any security held under this Article by other security on such terms and conditions as the case may be.

The security for the advance payment of the Supply of Equipment portion shall be valid and remain in full effect from the date of advance payment under the Contract until EGAT has received from the Contractor the original signed negotiable bills of lading and appertaining documents giving evidence of ninety (90) per cent shipment value of Equipment based on the price stipulated in the Contract for foreign supply and until EGAT has received from the Contractor the delivery orders and appertaining documents giving evidence of ninety (90) per cent ex-works delivery value based on the price stipulated in the Contract for local supply.

The security for the advance payment of the Local Transportation, Construction and Installation Work shall be valid and remain in full effect from the date of advance payment under the Contract until EGAT has received full refund of the same amount by deducting from each monthly progress payment.

Unless and until an official receipt is issued for a security deposit, EGAT will not be responsible for any such deposit lodged under this Article and will not effect the advance payment.

The advance payment security, in case of being a bank guarantee, or similar guarantee, shall be in conformity with the specimen acceptable to EGAT as shown herein at the end of these General Conditions.

## SPECIMEN OF PERFORMANCE SECURITY

To :

Date \_\_\_\_\_

Electricity Generating Authority of Thailand  
Bangkrui, Nonthaburi 11130,  
Thailand

Re : Performance Security for Contract  
No. EGAT \_\_\_\_\_

Gentlemen :

In accordance with the provision of the Contract for design, manufacture, supply, construction and installation of \_\_\_\_\_ No. EGAT \_\_\_\_\_ (hereinafter referred to as the Contract) the contents of which have been noted by us that Messrs. \_\_\_\_\_ (hereinafter referred to as the Contractor) has to deposit with the Electricity Generating Authority of Thailand (hereinafter referred to as EGAT) a Performance Security for the proper and faithful performance of the Contract in the amount of \_\_\_\_\_ (in words: \_\_\_\_\_) which is \_\_\_\_\_ per cent, round up to the nearest whole number, of the total Contract Price, we, the \_\_\_\_\_ as instructed by the Contractor, agree unconditionally to irrevocably guarantee as primary Obligor, the payment to EGAT on its first demand, without whatsoever right of objection on our part and without its first claim to the Contractor, in the amount not exceeding \_\_\_\_\_ (in words: \_\_\_\_\_) in the event of the obligations expressed in the above mentioned Contract have not been fulfilled by the Contractor, giving EGAT the right of claim for penalty, damages, liquidated damages or any expenses for which the Contractor may become liable to EGAT under the Contract.

We further agree that no extension of time, change in, addition to or other modification of terms of the Contract or Work to be performed thereunder, or of the Specifications or other Contract Documents, which may be made between EGAT and the Contractor, shall in any way release us from any liability under the Performance Security, and we shall thereby waive notice of any such extension of time, change, addition or modification.

This Performance Security shall be valid and remain in full effect from the date of execution of the Contract until the issuance of the Provisional Acceptance Certificate by EGAT against submission by the Contractor of the Maintenance Security accepted by EGAT.

Yours very truly,

\_\_\_\_\_  
Authorized signature

**SPECIMEN OF ADVANCE PAYMENT SECURITY**  
**FOR**  
**SUPPLY OF EQUIPMENT**

To : \_\_\_\_\_ Date \_\_\_\_\_  
Electricity Generating Authority of Thailand  
Bangkruai, Nonthaburi, 11130  
Thailand  
Re : Advance Payment Security for Contract  
No. EGAT \_\_\_\_\_

Gentlemen :

In accordance with the provision of the Contract condition in Article E-36. Advance Payment Security and Article F-10. Payment, Messrs. \_\_\_\_\_ the Contractor, under the Contract No. EGAT \_\_\_\_\_, has to deposit with the Electricity Generating Authority of Thailand (hereinafter referred to as EGAT) an Advance Payment Security to guarantee his proper and faithful performance of the Contract in the amount of \_\_\_\_\_ (in words : \_\_\_\_\_) which is equal to the amount of advance payment as per Article F-10. Payment of the Contract, we, \_\_\_\_\_ the \_\_\_\_\_ as instructed by the Contractor, agree unconditionally to irrevocably guarantee as primary Obligor, the payment to EGAT (on its first demand) without whatsoever right of objection on our part and without its first claim to the Contractor, in the amount not exceeding \_\_\_\_\_ (in words : \_\_\_\_\_) in the event of the obligations expressed in the above mentioned Contract have not been fulfilled by the Contractor, giving the right of claim to EGAT for recovery of the advance payment from the Contractor under the Contract.

We further agree that no change in, addition to or other modification of terms of the Contract or Work to be performed thereunder, or of the Specifications or of other Contract Documents, which may be made between EGAT and the Contractor, shall in any way release us from any liability under this guarantee, and we shall thereby waive notice of any such change, addition or modification.

This Advance Payment Security for the Supply of Equipment portion shall be valid and remain in full effect from the date of advance payment under the Contract until EGAT has received from the Contractor the original signed negotiable bills of lading and appertaining documents giving evidence of ninety (90) per cent shipment value of Equipment based on the price stipulated in the Contract for foreign supply and until EGAT has received from the Contractor the delivery orders and appertaining documents giving evidence of ninety (90) per cent ex-works delivery value based on the price stipulated in the Contract for local supply.

Yours very truly,

\_\_\_\_\_  
Authorized signature

**SPECIMEN OF ADVANCE PAYMENT SECURITY**  
**FOR**  
**LOCAL TRANSPORTATION, CONSTRUCTION AND INSTALLATION WORK**

To : \_\_\_\_\_ Date \_\_\_\_\_

Electricity Generating Authority of Thailand  
Bangkrui, Nonthaburi, 11130  
Thailand

Re : Advance Payment Security for Contract  
No. EGAT \_\_\_\_\_

Gentlemen :

In accordance with the provision of the Contract condition in Article E-36. Advance Payment Security and Article F-10. Payment, Messrs. \_\_\_\_\_ the Contractor, under the Contract No. EGAT \_\_\_\_\_, has to deposit with the Electricity Generating Authority of Thailand (hereinafter referred to as EGAT) an Advance Payment Security to guarantee his proper and faithful performance of the Contract in the amount of \_\_\_\_\_ (in words : \_\_\_\_\_) which is equal to the amount of advance payment as per Article F-10. Payment of the Contract, we, the \_\_\_\_\_ as instructed by the Contractor, agree unconditionally to irrevocably guarantee as primary Obligor, the payment to EGAT (on its first demand) without whatsoever right of objection on our part and without its first claim to the Contractor, in the amount not exceeding \_\_\_\_\_ (in words : \_\_\_\_\_) in the event of the obligations expressed in the above mentioned Contract have not been fulfilled by the Contractor, giving the right of claim to EGAT for recovery of the advance payment from the Contractor under the Contract.

We further agree that no change in, addition to or other modification of terms of the Contract or Work to be performed thereunder, or of the Specifications or other Contract Documents, which may be made between EGAT and the Contractor, shall in any way release us from any liability under this guarantee, and we shall thereby waive notice of any such change, addition or modification.

This Advance Payment Security for Local Transportation, Construction and Installation Work shall be valid and remain in full effect from the date of advance payment under the Contract until EGAT has received full refund of the same amount by deducting from each monthly progress payment.

Yours very truly,

\_\_\_\_\_  
Authorized signature

**SECTION F**  
**SPECIAL CONDITIONS**

## **SPECIAL CONDITIONS**

### **F-1. Scope of Work**

The Work covered by this Contract shall include the design, test and manufacture of towers; supply of all Equipment (with the exception of the Equipment to be furnished by EGAT), and labor, and the performance of all Work and services necessary for constructing and installing the transmission line and associated work, as shown on the drawings and specified herein, or as otherwise directed by EGAT.

Customs clearance shall be made by the Contractor and all customs formality procedures including opening and closing multiple shipment procedures shall be done at the responsibilities of the Contractor.

### **F-2. Responsibility of Contractor**

The Contractor shall be solely responsible for the adequacy of his design work and shop and construction detailing and for coordinated functioning of all Equipment and for adequate construction and installation for the transmission line as required under these Contract Documents. The Contractor shall procure and furnish the necessary Equipment; shall do all Work required for the construction and installation; shall furnish and procure all construction equipment, tools, transportation, fuel, electric power and services; shall use and protect any Equipment which may be furnished or loaned by EGAT; shall be responsible for the construction and maintenance of the necessary construction camps, access roads, offices and storage yards; and shall perform and make all necessary arrangements for all other work necessary for the completion of the transmission line. Where the Contractor proposes to deviate from the Specifications in accordance with Article B-9. Deviations from Specifications, he shall also be solely responsible for the deviations.

### **F-3. Equipment to be Furnished by EGAT**

Equipment to be furnished by EGAT to the Contractor, if any, are shown in List of Equipment to be Furnished by EGAT attached in Section H : Attachments. The exact quantity of each Equipment item to be furnished shall be determined after check survey and staking have been performed by the Contractor. Subject to Article E-23. Changes and Extra or Omitted Work, such quantities of Equipment as agreed upon by both parties after complete check survey and staking shall be final and conclusive.

In case the conductor is specified to be furnished by EGAT, the quantity of conductor furnished will be the length of the horizontal distance of the transmission line route plus one and a half (1.5) per cent extra length to cover sag, terrain irregularities and wastage. This quantity is deemed to be sufficient for carrying out the Work under this Contract. If for any reason there is any shortage of the conductor during the construction, the Contractor shall supply this deficit at his own expense, unless it is reasonably established and agreed by EGAT that additional conductor was in fact required.

EGAT will try its best effort to provide the conductor to the Contractor from time to time (just in time basis) during the construction according to the actual construction progress of work, which will be agreed in each Monthly Construction Meeting. However, despite its best effort, if EGAT fails to provide the conductor to the Contractor within the agreed time to enable the Contractor to complete the Work as scheduled, the Contractor can claim an extension of time only. All other expenses expected to be incurred from the adjustment of the construction equipment and resources due to the late supply of the conductor shall be included in the Contract Price. The Contractor shall be responsible for any expenses such as warehouse and godown rent in case he fails to take the conductor to his custody from the place to be advised by EGAT within fourteen (14) Days after EGAT's notification.

The Contractor shall be fully responsible for proper and safe handling of all the Equipment to be furnished by EGAT for performance of the Work under this Contract. Utmost care shall be taken to safeguard the said Equipment from losses or damages of any nature during the time that the Equipment are kept in custody of the Contractor. Should there be any loss of, or damage to, the Equipment furnished by EGAT, the Contractor shall, at his own expense, replace or make good the same as EGAT may deem expedient.

#### **F-4. Transportation**

The Contractor shall be responsible for transportation of all Equipment supplied by him and of all tools and Equipment from the point of origin to the site of Work.

All expenses for handling and transportation shall be included in the Contract Price.

The Contractor shall also be responsible for the handling and transportation of the Equipment furnished by EGAT under this Contract from Bangkok and/or its vicinity, at points to be designated by EGAT, to the site of the Work.

In case of conductor furnished on returnable metal reels, the Contractor shall be responsible for handling and transportation and for the timely return of empty reels



within 120 Days after the date he received them, from the site of work to Bangkok and/or its vicinity, at the point to be designated by EGAT. In case the Contractor does not return the empty reels within the stated 120 Days, EGAT will withhold 30,000 Baht per reel from monthly progress payment. This money will be used to cover any monetary damage to EGAT due to the delay in returning the reels. The balance will be paid to the Contractor after he has returned the reels.

#### **F-5. Survey**

##### **a. Check Survey**

EGAT will make available to the Contractor, reference points installed by EGAT as shown on the drawings except those installed by the Contractor during additional survey work. The Contractor shall carefully protect and preserve all reference points. Should any of the reference points need to be moved, such work shall be done at the Contractor's expense with the instruction of EGAT.

The Contractor shall on his own responsibility conduct all surveys that are necessary to determine the position, dimension, line and grade of all parts of the Work.

EGAT may, if it deems necessary, order the Contractor to submit field logs of survey records in order to check the results of the surveys or take measurement to check the accuracy.

##### **b. Check Staking of Tower Locations**

In case the check survey and staking of tower locations have been carried out by EGAT, the Contractor is required to check staking. In the event that the Contractor cannot find any stakes, he shall immediately inform EGAT. Re-staking of such tower locations shall then be made by EGAT.

#### **F-6. Revision of Price Schedule**

As soon as practicable but not more than six (6) Months after confirmation of Letter of Award of Contract, the Contractor is required to complete the check survey, staking and the sub-soil tests, including the determination of the tower foundation types, together with the relevant pile lengths wherever piles are required. In so doing if there should be any alterations such as change in the line route, towers, foundations, etc., from the original Proposal, the Contractor shall immediately notify EGAT for

approval with all supporting documents. After approval from EGAT, the Contract Price Schedule will be revised accordingly with adjustment based on applicable units and unit prices in the Schedule. The key map, plan and profile drawings and structure list will also be revised to conform to the changes and these documents shall be deemed final for construction purposes.

In the event there should be any changes thereafter, if the changes are a result of Contractor deviations, he shall in no case be entitled to the claim for any additional Equipment furnished or Work performed. However, in case the changes are initiated by EGAT, adjustment of applicable units, unit prices and Contract Price will be made accordingly.

**F-7. Drawings and Specifications Provided by EGAT**

The drawings included in these Contract Documents show the Work to be done under this Contract in detail as complete as possible at the present stage of design. However, the drawings shall be used for bidding purpose only and shall not be used for construction and installation of the Work.

Two copies of key map, plan and profile drawings and structure list will be furnished to the Contractor after award of the Contract. One copy of the corrected key map, plan and profile drawings and structure list along with all required diagonal profile and plan drawings for hillside towers, if any, shall be returned to EGAT with check survey data.

As construction of the Work progresses, the Contractor will prepare shop and construction drawings. EGAT will review, approve and issue these detailed construction and installation drawings and data as required for the Work. All such drawings and data, including the latest revisions thereof, will be affixed with a "FOR CONSTRUCTION" stamp. All work performed from the drawings and data without such stamp by EGAT shall be at the Contractor's risk.

The Contractor shall keep a copy of the Specifications and drawings at the work site and shall at all time give EGAT access thereto. Anything mentioned in the Specifications and not shown on the drawings or shown on the drawings and not mentioned in the Specifications shall be of similar effect as if shown or mentioned in both. In the case of discrepancies between drawings and Specifications, the Specifications shall govern. In any case of discrepancy, either in the figures, in the drawings or in the Specifications, the matter shall be promptly submitted to EGAT, who will make a determination in writing. Any adjustment by the Contractor without this determination shall be at the Contractor's risk and expense.

**F-8. Drawings and Data to be Furnished by the Contractor**

Prior to commencement of the Work, the Contractor shall submit drawings and data to EGAT for approval. Should EGAT direct modifications to be made in order to satisfy the requirements of the Specifications, the Contractor shall submit revised approval drawings. Alteration in the Contract Price shall not be allowed by reason of the modifications in the approval drawings. All drawings and information contained thereon, including all rights to future use, shall become the property of EGAT.

All calculations made by the Contractor in support of drawings made by the Contractor shall be made available to EGAT at EGAT's specific request.

EGAT will approve each drawing within forty-five (45) Days after receipt at EGAT's Office. One print each of the drawings submitted for approval will be returned to the Contractor by EGAT or its authorized representative, marked either "Approved", "Approved Except As Noted", or "Returned for Correction/Not Reviewed". The notation "Approved" or "Approved Except As Noted" will authorize the Contractor to proceed with the work, subject to the corrections, if any, indicated thereon. When prints of drawings have been "Returned for Correction/Not Reviewed", the Contractor shall make necessary revisions on the drawings and shall resubmit drawings for approval in the same manner as before.

Approval of the Contractor's drawings shall not be held to relieve the Contractor of any part of his obligation to meet all of the requirements of these Contract Documents or of the responsibility for the correctness of his drawings.

The Contractor shall submit the drawings and data in accordance with the following requirements for any Equipment and Work required and specified in the Contract to EGAT for approval:

a. Approval Drawings and Data

The Contractor shall submit the following drawings and data in accordance with the following requirements to EGAT for approval:

1. Plan and Profile drawings and structure list from check survey and survey (if any).
2. Tower drawings consisting of:
  - (a) Design drawings and calculations.
  - (b) Detailed shop and erection drawings including tower framing; size and length of each member; spacing of holes in each member; joint

details including gusset plate dimensions; number, sizes and lengths of bolts and fillers at each joint; details of bolts, nuts, lock nuts, fillers, washers and spring washers; and details showing attachments of insulator assemblies and overhead ground wire assemblies, tower signs and other tower accessories.

(c) Bill of materials.

3. Proposed procedures for tower testing including rigging, method of applying loads and measuring deflections and other pertinent data.
4. Proposed test procedures for spacer-dampers in accordance with the specifications and drawings.
5. Proposed test procedure for fiber optic transmission system test.
6. Proposed procedure for subsoil tests, ground resistance and earth resistivity tests.
7. Proposed procedures for pile tests.
8. Each type of insulator string assemblies with all fittings.
9. Each type of overhead ground wire assemblies with all fittings.
10. Detailed assemblies drawings of reel, dimensions, materials to be used and method of construction for conductor and overhead ground wire.
11. Detailed drawings of line accessories consisting of sleeves, splices, vibration dampers, spacers, spacer-dampers, patch rod, and etc.
12. Tower foundation drawings consisting of design drawings and calculation including the determination of number, size and length of piles for each foundation, detailed drawings of foundations and piles.
13. Foundation list.
14. Ground electrode list.
15. Detailed drawings of grounding materials and ground connections consisting of ground rods, ground connecting wires, ground rod clamps, ground connectors, exothermic connector, compression type connector and counterpoise wire.
16. Detailed drawings of joint boxes and clamps for wire with optical fibers including recommended locations and quantity.

17. Detailed drawings of each type of fiber optic transmission system Equipment including catalogues, handbooks, instruction and maintenance manuals.
18. Progress schedule.
19. Safety program.
20. Quality assurance program.
21. Monthly report.
22. Fabrication or manufacturing and test schedules of Equipment.

The title of the drawing, EGAT's Contract Number, the signature of the Contractor's engineer and the date prepared shall appear in the bottom right-hand corner of the drawing. The authorized signer on the engineering drawings shall be a professional engineer and shall obtain a license from a professional association for the related design work. The local engineer shall obtain a license from the Board for the Control of Engineering Profession.

The sizes of the drawings shall be as follows:

<u>Size Designation</u>	<u>Dimension in mm</u>	<u>Dimension in Inches</u>
A1	594 x 841	23.39 x 33.11
A3	297 x 420	11.69 x 16.54
A4	210 x 297	8.27 x 11.69

All shop and construction drawings shall be size A1. Reports, data and drawings within reports shall be submitted in size A4. Size A3 may be used if folded within a report.

Size of characters for description and notes in the drawings larger than A3 size shall be large enough to be readable when reprint such drawings with reduction to size A3.

b. Reproducible Drawings

Reproducible drawings of all final approved drawings including tower shop and erection drawings shall be made on paper.

- c. CD-ROM. Compact disc-read only memory (CD-ROM) shall conform to the applicable International Standard Organization 9660 (ISO 9660) and shall have capacity of approximately 700 Mbytes.

The data in CD-ROM shall be created by the following software :

<u>Document</u>	<u>*Drawing</u>	<u>Drawing/Document List</u>
Adobe Portable Document Format File (PDF format) together with Program of Acrobat Reader	MICROSTATION software version SE or AUTOCAD software version 2000	Microsoft Excel File

In case of creating drawing data by another software, the Contractor shall convert the data into Drawing Interchange File format (DXF).

\*Any necessary information supporting the completion of reading files (such as special font, etc.) shall be included in CD-ROM.

d. Number of Copies and Submission Schedule

EGAT reserves the right to require the Contractor to submit the drawings and data listed below by the designated dates either by registered airmail for foreign mail and registered mail for local mail and/or by electronic files uploaded via document management system. However, cover letters shall be submitted in hard copy to EGAT.

Should EGAT require the Contractor to submit the drawings and documents in electronic files via EGAT's document management system, the Contractor is also required to submit the drawings and documents in Print and CD-ROM at the number of copies listed in the parenthesis below.

<u>Description</u>	<u>Number of Copies</u>	<u>Deadline and Remark</u>
<b>1. Approval drawings and data</b>		
<b>Additional Survey :</b>		
Plan and Profile drawings	2(2)	Prior to performance of check survey
<b>Check Survey :</b>		
Plan and Profile drawings	1(1)	Within 180 Days after confirmation of Letter of Award of Contract
Structure list	1(1)	Within 180 Days after confirmation of Letter of Award of Contract

<u>Description</u>	<u>Number of Copies</u>	<u>Deadline and Remark</u>
<b>Towers:</b>		
Drawings list including titles, numbers and submission Schedule	4(-)	Within 30 Days after confirmation of Letter of Award of Contract
Design drawings and calculation	4(-)	Within 60 Days after confirmation of Letter of Award of Contract
Shop and erection drawings	4(-)	Within 120 Days after confirmation of Letter of Award of Contract
Stub angle drawings	4(-)	Within 60 Days after confirmation of Letter of Award of Contract
Bill of materials	4(-)	Not less than 30 Days before each shipment
<b>Test procedures :</b>		
Tower load test	1(-)	Not less than 60 Days before date fixed for test
Quality assurance programs	1(-)	Within 45 Days after confirmation of Letter of Award of Contract
Insulators, hardwares and fittings	1(-)	Not less than 45 Days before date fixed for test
Vibration dampers and spacer-dampers	1(-)	Not less than 60 Days before date fixed for test
Sub-soil	4(-)	Not less than 30 Days before date fixed for test
Ground resistance and earth resistivity	4(-)	Not less than 30 Days before date fixed for test
Piles	4(-)	Not less than 60 Days before date fixed for test

<u>Description</u>	<u>Number of Copies</u>	<u>Deadline and Remark</u>
<b>Tower foundation :</b>		
Design drawings calculation	4(-)	Not less than 60 Days before start of relevant foundation work
Detailed construction drawings and rebar bending diagrams	4(-)	Not less than 60 Days before start of relevant foundation work
Foundation list	4(2)	Within 30 Days after completion of subsoil tests
<b>Conductor and overhead ground wire including detail assembly drawings of reel</b>	4(-)	Within 150 Days after confirmation of Letter of Award of Contract
<b>Insulators, hardware</b>	4(-)	Within 150 Days after confirmation of Letter of Award of Contract
<b>Fiber optic transmission system Equipment :</b>		
Reference drawing, Detailed drawings and catalogues		
(a) Overhead Ground Wire with Optical Fiber (OPGW)	5(-)	Within 60 Days after confirmation of Letter of Award of Contract
(b) OPGW assemblies and line accessories	5(-)	Within 60 Days after confirmation of Letter of Award of Contract
Factory test procedure	5(-)	Within 120 Days after confirmation of Letter of Award of Contract
Installation procedure	5(-)	Not less than 30 Days prior to the installation start date
Field test procedure	5(-)	Not less than 30 Days before date fixed for test



<u>Description</u>	<u>Number of Copies</u>	<u>Deadline and Remark</u>
List of Installation Equipment	5(-)	Within 60 Days after confirmation of Letter of Award of Contract
<b>Spacer-dampers :</b>		
Detailed drawings	4(-)	Within 150 Days after confirmation of Letter of Award of Contract
Design calculation and recommended for installation on various span lengths including total quantity to be used	4(-)	Within 60 Days after receipt of plan and profile drawings and locations and spacing structure list for construction
<b>Vibration dampers and rigid spacers :</b>		
Detailed drawings including recommended locations and spacing for installation on various span lengths	4(-)	Within 150 Days after confirmation of Letter of Award of Contract
<b>Tower grounding :</b>		
Detailed drawings	4(-)	Within 150 Days after confirmation of Letter of Award of Contract
List of ground electrodes	4(2)	Within 30 Days after complete ground resistance tests
Other drawings, data, reports or programs	4(-)	Within 180 Days after confirmation of Letter of Award of Contract
Subsoil test reports	4(-)	Initial not more than 60 Days after confirmation of Letter of Award of Contract. Last report within 180 Days after confirmation of Letter of Award of Contract.

	<u>Description</u>	<u>Number of Copies</u>	<u>Deadline and Remark</u>
2.	<b>Modified approval drawings and data for above</b>	4(*) each	Within 30 Days after receipt of returned drawings and data for correction  *Same as Number of copies required for approval drawings and data above
3.	<b>Final drawings and data</b>		
	(a) Reproducible drawings of all final approved drawings	1(-)	Within 30 Days after receipt of approved drawings
	(b) CD-ROM for all final approved drawings	3(3) each	Within 60 Days after receipt of approved drawings
4.	<b>Test reports, unless otherwise specified (Shop tests and field tests)</b>	1(-)	Not later than 15 Days after completion of tests
5.	<b>Instruction for operation and maintenance including manual and list of maintenance tools</b>	8(-)	Not later than 60 Days before shipment
6.	<b>Construction and Installation Program</b>	4(-)	Within 30 Days after confirmation of Letter of Award of Contract and monthly subsequently
7.	<b>Fabrication or manufacturing and test schedule of Equipment</b>	1(-)	Within 45 Days after confirmation of Letter of Award of Contract

**F-9. Schedule of Work and Monthly Reports**

At regular monthly intervals and at his own expense the Contractor shall submit, all together, the following detailed reports to EGAT:

- a. Progress Report, covering progress for the preceding Month, and outlining the intended work program for the following Month.
- b. Schedule of Work Completion, showing for each item of work completed in the previous Month, actual completion dates compared against the approved construction schedule.

For all items not completed as yet, showing the proposed completion dates versus the approved schedule.

- c. Estimate of monthly certified payments for completed work, for the following six (6) Months, indicating the amounts to be paid in foreign currency and in Baht.
- d. Inventory of Contractor's plant, Equipment and materials listing the following:
  - 1. Quantities used and installed in the previous Month
  - 2. Quantities required for use and installation in the following Month
  - 3. Total quantities at present available
- e. Record of Contractor's employees, listing the supervisory staff and all other classes of labor, with the total number of each class employed during the preceding Month and those required on the intended work program for the following Month.

#### **F-10. Payment**

Partial payments will be made for the various items at the appropriate unit price or lump sum in the currency or currencies in which the price has been stated in the Price Schedule as follows :

- a. Foreign Currency Portion

Payment in foreign currency will be made in the currency or currencies in which the price has been stated in the Price Schedule. The Contractor has to inform EGAT the mode of payment he requires for payment for foreign currency portion together with detail of bank account no., beneficiary's name and address etc. If the Contractor requires the payment of foreign currency portion to be paid directly to the suppliers, he has to inform EGAT which portion of the Contract Price, as stipulated in the term of payment of the Contract, to be paid accordingly. In case the local Contractor requires foreign currency or currencies to be paid directly to him, payment of such foreign currency or currencies will be made to the local Contractor in Thai Baht by using the selling exchange rate published by the Bank of Thailand on the payment date.

In case the Contractor requires the payment of foreign currency portion to be made through letter of credit, EGAT will, if there is no fault or any delay caused by the Contractor, establish the letter of credit in the name of the Contractor or Suppliers not later than thirty (30) Days after signing the Contract. The Contractor shall be responsible for all bank charges inside and outside Thailand and including opening, amendment, reimbursing charges, payment commission, cable charges, discrepancy fee, acceptance commission and others (if any) arising from Letter of Credit.

The Contractor or beneficiary has to inform EGAT by mailed letter or ***letter submitted electronically or by electronic mail (E-mail)*** immediately the date upon which he has received the original letter of credit to be opened in his favour.

1. Advance Payment

Ten (10) per cent of the foreign currency portion of the total Contract Price will be paid within sixty (60) Days after signing of the Contract against submission of an invoice together with an Advance Payment Security as specified in Article E-36. Advance Payment Security.

2. Supply of Equipment

Eighty (80) per cent of the amount will be paid after delivery FOB port of shipment (FOB vessel) on the basis of pro rata value of each shipment against presentation of invoices, shipping documents, EGAT's letter of approval for shipment and EGAT's letter of approval for test report\* of the relevant Equipment.

\*Test report means the test report of Shop Tests specified in Item a of Article E-16. Inspection and Tests.

The balance ten (10) per cent and the adjusted amount due, if any, will be made upon issuance of Provisional Acceptance Certificate with minor pending claims, if any, against submission by the Contractor of a maintenance security. In case there are some minor pending claim or fault of the Contractor, the payment of this balance will be made by deducting such claimed amount.

3. Test of Equipment

Ninety (90) per cent of the amount for the specified test and the adjusted amount due, if any, will be paid after the tests have been performed successfully and test reports have been accepted by EGAT.

4. Supply of Spare Equipment

Ninety (90) per cent of the amount and the adjusted amount due, if any, will be made after the Equipment has been arrived at site(s) as specified and against presentation of invoices, shipping documents, EGAT's letter of approval for shipment and acceptance has been made by EGAT.

b. Local Currency Portion

Partial payment will be made in Thai Baht directly by EGAT as follows:

1. Advance Payment

Ten (10) per cent of the local currency portion of the total Contract Price will be paid within sixty (60) Days after signing of the Contract against submission of an invoice together with an Advance Payment Security as specified in Article E-36. Advance Payment Security.

2. Supply of Equipment

Eighty (80) per cent of the amount will be paid on the basis of pro rata value of each delivery against presentation of the Contractor's statement or delivery order confirming the delivery of Equipment ex-works duly certified by EGAT's representative\*, EGAT's letter of approval for delivery and EGAT's letter of approval for test report\*\* of the relevant Equipment.

\*EGAT's representative means the authorized EGAT's Store personnel to verify the quantity of Equipment according to the packing list to be delivered to the site.

\*\*Test report means the test report of Shop Tests specified in Item a of Article E-16. Inspection and Tests.

The balance ten (10) per cent and the adjusted amount due, if any, will be made upon issuance of Provisional Acceptance Certificate with minor pending claims, if any, against submission by the Contractor of a maintenance security. In case there are some minor pending claim or fault

of the Contractor, the payment of this balance will be made by deducting such claimed amount.

3. Test of Equipment

Ninety (90) per cent of the amount and the adjusted amount due, if any, for the specified test and the adjusted amount due, if any, will be paid after the tests have been performed successfully and test reports accepted by EGAT.

4. Supply of Spare Equipment

Ninety (90) per cent of the amount and the adjusted amount due, if any, will be made after the Equipment has been delivered at site(s) as specified against EGAT's letter of approval for delivery and acceptance has been made by EGAT.

5. Local Transportation, Construction and Installation

Eighty (80) per cent of the amount of local transportation, construction and installation will be made monthly as the Work progresses, proportionately to the amount of Work completed during the foregoing Month except the payment for installation of insulators, insulator string and overhead ground wire assemblies and line accessories which shall be made after the completion of overhead ground wire or conductor stringing work of the portion installed. The Contractor shall thereby prepare after the end of each Month the monthly statement including estimated quantity of Work performed showing the estimated Contract value of the Work executed up to the end of the Month, and shall submit it to EGAT for approval.

The amount of the progress payment shall be calculated from the Price Schedule on the basis of the quantity of Work performed. For lump sum prices the amount of progress payment shall be calculated on the basis of the percentage of the estimated quantity of Work performed. The estimated quantity of Work performed used as the basis for calculation of progress payment shall be adjusted at the time of final payment according to the actual quantity of Work performed. In addition, the payment shall be made against the submission of Monthly Report as specified in Article F-9. Schedule of Work and Monthly Reports.

The balance ten (10) per cent and the adjusted amount due, if any, will be made upon issuance of Provisional Acceptance Certificate with minor pending claims, if any, against submission by the Contractor of a maintenance security. In case there are some minor pending claim or fault

of the Contractor, the payment of this balance will be made by deducting such claimed amount.

All Equipment and Work covered by partial payments shall thereupon become the property of EGAT, but this provision shall not be construed as relieving the Contractor from the sole responsibility as provided under this Contract for the care, protection and maintenance of Equipment and Work, upon such which partial payments have been made, and for completion of Work.

*After each payment is made, the Contractor or beneficiary shall issue and submit the receipt to EGAT at e-mail : FFMS@egat.co.th within three (3) calendar days upon receipt of such payment. The details of receipt shall include but not be limited to the following:*

- *Company name and address*
- *The receipt date of payment*
- *Lists of Goods/Services the payment is made for*
- *Payment amount in numbers and in words*
- *Recipient signature*

#### **F-11. Basis of Payment**

Unit prices or lump sum prices listed in the Price Schedule to be used for partial payments shall be based on the following basis.

##### **a. Supply of Equipment**

##### **1. Towers**

Unit price for each basic body, body extension, leg extension and stub angle listed in the Price Schedule shall be as follows :

##### **(a) Basic Body**

Unit price for each basic body shall include cost of all members and fittings comprising main legs, cross arms, bracing, plates, hangers, brackets, overhead ground wire arms or peaks, bolts, nuts, lock nuts, washers, fillers, step bolts and ladder (if any) including plates, bolts, nuts, lock nuts, washers, fillers and horizontal members for making connections between tower basic body and leg extensions or between tower basic body and body extension which are necessary to make a complete tower basic body assembly as shown on the drawings.

(b) Body Extension

Unit price for each body extension shall include cost of all members and fittings, comprising main legs, bracing, plates, bolts, nuts, lock nuts, washers, fillers, step bolts and ladder (if any) including plates, bolts, nuts, lock nuts, washers, fillers and horizontal members for making connections between tower body extension and leg extensions which are necessary to make a complete assembly attached to a tower basic body as shown on the drawings.

(c) Leg Extension

Unit price for each leg extension shall include cost of all members and fittings, comprising main legs, bracing, plates, bolts, nuts, lock nuts, washers, fillers and step bolts including plates, bolts, nuts, lock nuts, washer and fillers for making connection between tower leg extension and stub angle which are necessary to make a complete leg assembly of length specified, attached to a tower body or body extension as shown on the drawings.

(d) Stub Angles

Unit price for each stub angle shall include cost of stub angle, plates, cleat angles, bolts and nuts which are necessary to make a complete assembly for anchoring one leg of a tower to a foundation as shown on the drawings.

(e) Additional Galvanized Steel

Unit price for additional galvanized steel shall include cost of all steel materials including bolts, nuts, lock nuts, washers and fillers necessary to form a part of or complete towers caused by modification of tower design or additional steel work directed by EGAT per Article E-23. Changes and Extra or Omitted Work. Measurement shall be based on increased weight calculated from the weight resulting from modification of tower design directed by EGAT and the calculated weight of tower from approved shop detail drawings before modification. In case of additional steel work, measurement shall be based on the weight calculated from the approved detailed shop drawings of additional steel work.

No payment shall be made for additional galvanized steel caused by modification of tower by the Contractor or directed by EGAT to



fulfill the requirements specified in the Drawings, Specifications and Contract Documents.

2. Overhead Ground Wire and/or Conductor

Unit price for overhead ground wire and/or conductor, if any, shall include the cost of furnishing all overhead ground wire and/or conductor for the entire length of the line including extra length to cover for all jumpers, connections to tower, sag, terrain irregularity and wastage in accordance with the requirements of the Specifications. Measurement for payment of overhead ground wire and/or conductor shall be based on the horizontal distance along the center line of the transmission line route plus one and a half (1.5) per cent extra length to cover sag, terrain irregularities and wastage. If there is any shortage of the overhead ground wire and/or conductor during the construction, the Contractor shall supply this deficit at his own expense.

3. Overhead Ground Wire with Optical Fiber

Lump sum price for overhead ground wire with optical fiber shall include the cost of furnishing all overhead ground wire with optical fiber for the entire length of the line including extra length to cover for all connections to joint boxes, sag, terrain irregularity and wastage in accordance with the requirements of the Specifications.

For the purpose of partial payment, a calculated unit price shall be determined from the lump sum price divided by the total length of overhead ground wire with optical fiber recommended by the Contractor and approved by EGAT after the completion of check survey work.

Any expenses required for the additional length of overhead ground wire with optical fiber to fulfill the requirements of the Specifications shall be paid by the Contractor.

4. Hardware Assemblies and Line Accessories for Overhead Ground Wire with Optical Fiber

Lump Sump price for each type of hardware assemblies for overhead ground wire with optical fiber shall include the cost of furnishing all such Equipment for the entire length of the line in accordance with the requirements of the Specifications.

For the purpose of partial payment, a calculated unit price shall be determined from the lump sum price divided by the total quantity of such

Equipment recommended by the Contractor and approved by EGAT after the completion of check survey work.

Any expenses required for the additional quantity of such Equipment to fulfill the requirements of the Specifications shall be paid by the Contractor.

5. Spacer-Dampers

Lump sum price for spacer-dampers shall include the cost of furnishing all spacer-dampers for the entire length of the line in accordance with the requirements of the Specifications.

For the purpose of partial payment, a calculated unit price shall be determined from the lump sum price divided by the total quantity of spacer-dampers recommended by the Contractor and approved by EGAT after the completion of check survey work.

Any expenses required for the additional quantity of spacer- dampers to fulfill the requirements of the Specifications and field tests shall be paid by the Contractor.

6. Invar Conductor

Lump sum price for Invar Conductor shall include the cost of furnishing al Invar Conductors for the entire length of the line including extra length to cover for all jumpers, connections to towers, sag, terrain irregularity and wastage in accordance with the requirements of the Specifications.

For the purpose of partial payment, a calculated unit price shall be determined from the lump sum price divided by the total length of Invar Conductor recommended by the Contractor and approved by EGAT after the completion of check survey work.

Any expenses required for the additional length of Invar Conductor to fulfill the requirements of the Specifications shall be paid by the Contractor.

b. Local Transportation, Construction and Installation Work

1. Installation of Boundary Posts

Unit price for installation of each boundary post shall include all costs of labor, cement, water, fine aggregate, coarse aggregate, steel reinforcement and other necessary materials, tools and equipment for handling and transportation, earth excavation, dewatering, placing forms, mixing and

placing of concrete, repairing, finishing, protection and curing of concrete and back filling.

2. Construction of Tower Foundation

(a) Foundations

Unit price for construction of each tower foundation shall include all costs of labor, cement, water, fine aggregate, coarse aggregate, steel reinforcement and other necessary materials, tools and equipment for handling and transportation, earth excavation, dewatering, placing of forms, mixing and placing of concrete, repairing, finishing, protection and curing of concrete and back filling.

Cost of rock excavation including cost of labor and all necessary materials, tools and equipment for drilling and blasting the rock, and removing the excavated materials shall also be included in the unit price for tower foundation.

(b) Stub Angle

Unit price for installation of each stub angle shall include all costs of labor, materials, tools and equipment for handling, transportation, installing and setting of a complete assembly of stub angle for anchoring one leg of a tower to a foundation.

Payment for the applicable unit prices of above items shall be made upon completion of complete tower foundation for each location.

(c) Piles

Unit price for furnishing and installing piles per linear meter shall include all costs of labor, tools, materials, supplies, equipment and other necessary or incidental costs of manufacturing, furnishing, handling, installing, cutting of piles, construction build-ups and extensions, and all other work connected herewith. It shall also include all costs of jetting, drilling, blasting or other work as necessary. The length to be measured shall be as follows:

- (i) Measurement of length of furnished piles shall be determined from the number of linear meters of piles furnished by the Contractor and as shown on the foundation list approved by EGAT.

- (ii) Measurement of length of installed piles shall be made along the center line of the pile from the tip of the pile to the bottom of the pile cap.

No payment will be made for the furnishing and driving of false work piles, for piles driven out of place, for defective piles, for piles which are damaged in handling or driving.

(d) Pile Tests

Unit price for each pile test shall include all labor, material, anchor piles, pile caps, equipment and apparatus for performing compression, tension and lateral load tests of the pile, exclusive of the costs of test pile and installing of test pile. Costs for the test pile and installing of the test pile will be made at the applicable unit price for furnishing and installing pile in the Price Schedule. Whenever such pile or piles become an integral part of the foundation construction, payment will be made only once for the piles and pile installing.

3. Tower Grounding

Unit price for installation of each item of grounding materials listed in the Price Schedule shall include all costs of labor, materials, tools and equipment for handling, transportation, checking ground resistance and installation of that item.

4. Tower Erection

Unit price for installation of each basic body, body extension, leg extension and stub angle listed in the Price Schedule shall be as follows :

(a) Basic Body

Unit price for installation of each tower basic body shall include all costs of labor, materials, tools and equipment for handling, transportation and erection of complete tower basic body described in Article F-11a.1(a) including correcting, repairing and replacing of misfabricated or damaged members and numbering of tower-number signs.

(b) Body Extension

Unit price for installation of each tower body extension shall include all costs of labor, materials, tools and equipment for handling, transportation and erection of complete tower body extension

described in Article F-11a.1(b) including correcting, repairing and replacing of misfabricated or damaged members and numbering of tower-number signs.

(c) Leg Extension

Unit price for installation of each tower leg extension shall include all costs of labor, materials, tools and equipment for handling, transportation and erection of a complete leg extension described in Article F-11a.1(c) including correcting, repairing and replacing of misfabricated or damaged members, numbering of tower-number signs and bituminous coating on stub angles, concrete pedestal tops and bottom part of tower.

(d) Additional Galvanized Steel

Unit price for installation of additional galvanized steel shall include all costs of labor, materials, tools and equipment for handling, transportation and installation of additional galvanized steel caused by modification of tower design or additional galvanized steel work directed by EGAT per Article E-23, Changes and Extra or Omitted Work. Measurement shall be based on the difference between the increased weight resulting from modification of tower design directed by EGAT and the calculated weight of tower from approved detailed shop drawings before modification. In case of additional galvanized steel work, measurement shall be based on the weight calculated from the approved detailed shop drawings of additional galvanized steel work.

No payment shall be made for installation of additional galvanized steel caused by modification of tower by the Contractor or directed by EGAT to fulfill the requirements specified in the drawings, Specifications and Contract Documents.

5. Stringing of Overhead Ground Wire

Unit price for stringing of overhead ground wire shall include cost of stringing, splicing, temporary grounding, connecting, dead-ending, armoring, scaffolding, sagging, clamping, jumpering, dampering and spacing as applicable including cost of installing of overhead ground wire assemblies and line accessories. Measurement for stringing of overhead ground wire shall be based on the horizontal distance along the center line of the transmission line route.

6. Stringing of Overhead Ground Wire with Optical Fiber

Lump sum price for stringing of overhead ground wire with optical fiber shall include all costs of labor, materials, tools and equipment for stringing, repairing, connecting, jointing, dead-ending, armoring, scaffolding, sagging, clamping and jumpering of overhead ground wire with optical fiber for the entire length of the line in accordance with the requirements of the Specifications including installation of all hardware assemblies and line accessories to be associated with the overhead ground wire with optical fiber.

For the purpose of partial payment, a calculated unit price shall be determined from the lump sum price divided by the total horizontal distance along the center line of the transmission line route specified in the Price Schedule.

Any expenses required for stringing of additional quantity of composite overhead ground wire to fulfill the requirements of the Specifications shall be paid by the Contractor.

7. Transportation of Spare Equipment

Unit price for local transportation of each item of spare Equipment shall include all costs of labor, materials, tools and equipment for handling and transportation of that item to the place specified.

8. Obstruction Marking and Lighting for Air Navigation

(a) Marking and Lighting of Towers. Unit price for marking and lighting of towers shall include the cost of furnishing of all Equipment required and the cost of marking and lighting installation of the towers.

(b) Marking of Overhead Ground Wire. Unit price for marking of overhead ground wire shall include the cost of furnishing and installing of spheres.

9. Stringing of Invar Conductor

Lump sum price for stringing of Invar Conductor shall include all costs of labor, materials, tools and equipment for stringing, repairing, connecting, jointing, dead-ending, armoring, scaffolding, sagging, clamping and jumpering of Invar Conductor for the entire length of the line in accordance with the requirements of the Specifications including installation of fittings and accessories to be associated with the Invar Conductor.

For the purpose of partial payment, a calculated unit price shall be determined from the lump sum price divided by the total horizontal distance along the center line of the transmission line route specified in the Price Schedule.

Any expenses required for stringing of additional quantity of Invar Conductor to fulfill the requirements of the Specifications shall be paid by the Contractor.

The cost of supply of Equipment not specifically covered herein by detailed specifications and required for the safe and efficient construction and operation of the complete work, shall be included in appropriate unit prices in the Price Schedule as if specifically detailed therein.

In all cases and as applicable, handling, transportation and testing of the Equipment as well as expenses for supervision of the construction shall be included in the Contract Price.

#### **F-12. Liquidated Damages for Late Completion and Late Delivery**

##### **a. For Complete Construction of Transmission Line**

If the Contractor fails to meet any of the completion date set forth in these Contract Documents, plus any extensions of time thereof authorized by EGAT as provided in the Contract, such failure shall be a default under the Contract for which the Contractor shall be liable for payment to EGAT as liquidated damages, at the rate of one-tenth of one (0.10) per cent of the total Contract Price for that particular schedule for each Day of delay. This sum is payable regardless of the actual loss and/or damages incurred. The total amount of liquidated damages assessed under this article against the Contractor in aggregate shall not exceed ten (10) per cent of the total Contract Price of that particular schedule, thereafter EGAT shall have the right, at its sole discretion, to terminate the Contract.

Payment of liquidated damages is contingent exclusively upon late completion; in no case shall EGAT be required to substantiate any claim for payment of liquidated damages with proof of loss and/or damages.

##### **b. For the Supply of Additional Equipment not Used in the Construction, Including Spare Equipment**

In the event of failure by the Contractor to make delivery of Equipment not permanently used in the Construction, including spare Equipment, within the

delivery date set forth in the Contract, plus any extension thereof authorized by EGAT as provided in the Contract, such failure shall be a default under the Contract for which the Contractor shall be liable for payment to EGAT as liquidated damages, at the rate of one-tenth of one (0.10) per cent of the price of the Equipment not timely delivered for each Day of delay. This sum is payable regardless of the actual loss and/or damages incurred, provided, however, that the total claim of liquidated damages shall not exceed ten (10) per cent of the Contract Price of such delayed Equipment.

Whenever any Equipment is to be used together with the other Equipment as a complete set or unit, the Contractor shall make sure that they shall be delivered together as a complete set or unit. Failure on the part of the Contractor to comply with this requirement, the liquidated damages for late partial delivery of such Equipment shall be imposed on the Contractor for the whole amount of the Contract Price of such complete set or unit and the total claim of payment shall not exceed ten (10) per cent of the Contract Price of such complete set or unit.

Notwithstanding, in case the Contractor fails to make delivery of minor part of any Equipment within the time set forth in the Contract and such late delivery does not have any effect to the performance of the Equipment, the Contractor shall be liable for payment to EGAT as liquidated damages at the rate of one-tenth of one (0.10) per cent of the total price of the minor part of the Equipment not timely delivered for each Day of delay and the total claim of liquidated damages shall not exceed ten (10) per cent of the price of such delayed minor part of the Equipment. The price of such delayed minor part of the Equipment shall be determined by EGAT. EGAT shall, at his own discretion, determine whether such late delivery Equipment is the minor part and has any effect to the performance of the Equipment or not.

In case any Equipment is defective or does not conform to the requirements or specifications of the Contract where replenishment or correction or replacement must be made by the Contractor as per Article E-32. Failure to Meet Requirements, it shall be deemed that such Equipment has not yet been delivered unless such Equipment has been replenished or corrected or replaced, as the case may be, and delivered to EGAT at the delivery point specified in the Contract.

Payment of liquidated damages is contingent exclusively upon late delivery; in no case shall EGAT be required to substantiate any claim for payment of liquidated damages with proof of loss and/or damages. The liquidated damages shall be calculated for each Day of delay until the Equipment is delivered to EGAT excluding a period of time from the actual delivery date at the delivery point set forth in the Contract until the issuance of notification of defect or short



pack or out of specification made by EGAT to the Contractor. This sum is payable regardless of the actual loss and/or damages incurred.

In case of delay in delivery of accessories/tools of any item which are not requisite for the use/operation of the equipment of that particular item, the liquidated damages for the late delivery of such accessories/tools shall be imposed on the Contractor at the rate of one-tenth of one (0.10) per cent of the price of such accessories/tools for each Day of delay, provided that the total claim for liquidated damages shall not exceed ten (10) per cent of the price of such accessories/tools.

The payment of such damages shall not relieve the Contractor from his obligations to complete the Work under the Contract.

The Contractor will not be liable for liquidated damages in the event of delay caused by force majeure.

#### **F-13. Final Statement of Work Performed and Payment**

Prior to receiving of Provisional Acceptance Certificate of the Work as provided and contemplated by the Contract, the Contractor shall present to EGAT for review and approval final statement of the Work performed.

After approval of the final statement, EGAT will pay to the Contractor any balance that may be due to the Contractor according to final statement as approved by EGAT.

#### **F-14. Provisional Acceptance Certificate**

If the inspection and tests show that the completed Work under the Contract or under each specific Schedule(s) which is/are specified for partial Provisional Acceptance Certificate as specified in Section C. Proposal complies with the requirements of the Contract Documents, or if such Work under this Contract has been performed to be satisfactorily completed and put into commercial use and there are no major unsettled claims against the Contractor by EGAT, EGAT will issue a written Provisional Acceptance Certificate with list of minor pending claim, if any, for the Work under the Contract or for the Work under any specific Schedule(s) against submission by the Contractor of maintenance security(ies) as specified in Article F-18. Maintenance Security and effective for a period of time as specified in Article F-17.a.

However, if, through no fault of the Contractor or of the Work, the issuance of Provisional Acceptance Certificate is delayed beyond a period of six (6) Months after all prerequisite conditions and submission of maintenance security by the Contractor have been fulfilled, the Work will be deemed to be provisionally accepted and release of ten (10) per cent and the adjusted amount due, if any, will be made at the end of the said six (6) Month period. In case there are some minor pending claims or minor fault of the Contractor, the payment will be made by deducting such pending claim amount and the guarantee period of this minor claim or fault will start after such minor claim or fault has been settled by the Contractor and acceptance of which has been made by EGAT.

A form of maintenance security acceptable to EGAT is shown in Article F-18. Maintenance Security.

**F-15. Final Inspection**

After the Work has been completed, the Contractor shall inform EGAT to that effect. After being so informed, EGAT may make all necessary inspections and tests to determine whether the completed Work conforms to the requirements of the Specifications.

Should the result of the inspection or tests show failure to satisfy the requirements of the Specifications, EGAT may at its own volition and option refuse acceptance of the Work and require the defective portion of Work to be corrected. Until the necessary corrections are re-inspected and retest have been made to EGAT's satisfaction, the terms and conditions of the Contract shall not be considered fulfilled.

If, however, the defects are not corrected within a reasonable time, EGAT may proceed to make the corrections at the Contractor's risk and expense, but without prejudice to any other rights which EGAT may have against the Contractor for failure to remedy such defects.

**F-16. Final Acceptance Certificate**

When all the Work under the Contract or under each specific Schedule(s) in accordance with Article F-14. Provisional Acceptance Certificate has been completed, the Contractor shall notify that result to EGAT at the expiration of the guarantee period of such Work as designated under Article F-17. Maintenance Guarantee. After having received such notice, EGAT will make a final inspection

within fifteen (15) Days. If the Work is found satisfactorily completed and in operating conditions, and no major items are still under guarantee, EGAT will issue to the Contractor a Final Acceptance Certificate for the Work under the Contract or for the Work under any specific Schedule (s) which shall specify the date of EGAT's acceptance. EGAT shall take over such particular Work on that date and the Contractor shall thereafter be released of all obligations and responsibilities under the Contract for such particular Work. The maintenance security for such Work will also be released and returned to the Contractor.

**F-17. Maintenance Guarantee**

- a. The Contractor shall guarantee the proper functioning of the Work for a period as specified hereunder:

**For 115 kV and 230 kV Transmission Lines with Single and Twin-Bundled Conductor per Phase**

One (1) Year from the day immediately following the date of provisional acceptance of the Work specified in PAC issued by EGAT; provided, however, that should any malfunctioning and/or latent defect be found in the Work during the said period, and such malfunctioning and/or defective portion be repaired or replaced as stipulated in c and d herein below, then the guarantee period shall be extended for one (1) year beginning from the day immediately following the date of the completion of such repair or replacement.

**For 230 kV and 500 kV Transmission Lines with Four-Bundled Conductor per Phase**

One (1) Year from the day immediately following the date of provisional acceptance of the Work specified in PAC issued by EGAT for all the Work except conductor hardware assemblies, insulators and conductor spacer dampers and three (3) Years from the day immediately following the date of provisional acceptance of the Work specified in PAC issued by EGAT for conductor hardware assemblies, insulators and conductor spacer dampers

Provided, however, that should any malfunctioning and/or latent defect be found in the Work during the said period, and such malfunctioning and/or defective portion be repaired or replaced as stipulated in c and d herein below, then the guarantee period shall be extended as follows : -

- (1) All the Work except Conductor Hardware Assemblies, Insulators and Spacer Dampers for Conductor

- Any malfunctioning and/or defect found within the guarantee period : For a new period of one (1) Year from the day immediately following the date of completion such repair and replacement

(2) Conductor Hardware Assemblies, Insulators and Spacer Dampers for Conductor

- Any malfunctioning and/or defect found within the first Year of guarantee period : For a new period of three (3) Years from the day immediately following the date of completion of such repair and replacement
- Any malfunctioning and/or defect found within the second Year of guarantee period : For a new period of two (2) Years from the day immediately following the date of completion of such repair and replacement
- Any malfunctioning and/or defect found within the third Year of guarantee period : For a new period of one (1) Year from the day immediately following the date of completion of such repair and replacement

The premium of the maintenance guarantee shall be paid by the Contractor.

- b. For the case that there is only one maintenance guaranteed period for the Work under the Contract, upon issuance of a Final Acceptance Certificate by EGAT, the Contractor shall thereafter be released of all obligations and responsibilities under the Contract and the maintenance security deposited in accordance with Article F-14. Provisional Acceptance Certificate will be released and returned to the Contractor.

Notwithstanding the foregoing, in the event that there are several maintenance guarantee periods for different work as provided in item a. in this Article, and all obligations and responsibilities of the Contractor for such work (except the work guaranteed for the last guaranteed period) have been fulfilled, the maintenance security guaranteed for such work and deposited in accordance with Article F-14. Provisional Acceptance Certificate will be released and returned to the Contractor regardless of the non-issuance of the Certificate of Final Acceptance.

- c. If during the guarantee period EGAT finds any malfunctioning and/or defect in the Work, EGAT shall inform without delay the Contractor thereof, stating in writing the nature of the malfunction and/or defect, and the Contractor shall promptly commence to repair, replace or reinstall such malfunctioning and/or defect at the expense of the Contractor except that the cost of import duty and taxes of the replacement parts for foreign supplied Equipment will be borne by

EGAT. In case the defect is in EGAT supplied Equipment, and not due to the Contractor, the cost of correction will be borne by EGAT or the Work may be performed by EGAT without prejudice to the guarantee.

- d. If, after the repair or replacement performed in accordance with this Article, such work continues to show malfunctioning and/or defect, EGAT may, at its option, demand further repair or replacement, and reserve the right to claim damages, if applicable, arising therefrom.
- e. If the Contractor, in general, fails to take action for starting up the necessary works for repair or replacement within fourteen (14) Days after receipt of EGAT's written notice of defect, the defect will be corrected by EGAT or any third party selected by EGAT at EGAT's discretion and the cost of the corrections shall be on the responsibility and account of the Contractor.

In the event of an emergency where in the judgement of EGAT the delay resulting from giving formal notice would cause serious loss or damage which could be prevented by immediate action, defects may be corrected by EGAT or a third party chosen by EGAT without giving prior notice to the Contractor, and the cost of the corrections shall be paid by the Contractor. In the event such action is taken by EGAT, the Contractor will be notified promptly and shall assist wherever possible in making the necessary corrections.

#### **F-18. Maintenance Security**

The Contractor shall provide to EGAT prior to the issuance of the Provisional Acceptance Certificate and as a condition for the release of the payment of the last instalment as specified in Article F-10. Payment, maintenance security(ies) in the amount of ten (10) per cent, round up to the nearest whole number, of the total Contract Price of each independent schedule, guaranteeing the Contractor's performance of the provision of Article F-17. Maintenance Guarantee. The Contractor shall oblige himself to attend to and replace, during the period of maintenance, all malfunctioning parts and for repair of all defects noted in the Work and communicated to the Contractor in writing by EGAT.

In case of extended guarantee of the repaired or replaced Equipment/Work, the Contractor may request for return of the original maintenance security in the amount of ten (10) per cent, round up to the nearest whole number, of the Contract Price and submit a new maintenance security in the amount of ten (10) per cent, round up to the nearest whole number, of the Contract Price of the Equipment/Work under the extended guarantee.

In case all obligations on the part of the Contractor for the work under separated guarantee period as specified in Article F-17.a. 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.

The maintenance security shall be in the form of a cash deposit, or a cashier cheque issued by a local bank, or a bank guarantee or letter of guarantee issued only by a local bank or an acceptable financial institution in Thailand, or by a foreign bank counter-guaranteed by a local bank and made payable to EGAT in the same currency as that of the Contract. In case of a cash deposit or a cashier cheque, only Thai baht portion of the Contract Price can be made. EGAT may at its absolute discretion refuse to approve any maintenance security offered or may at any time, upon application by the Contractor, approve of the substitution for any maintenance security held under this Article by other maintenance security on such terms and conditions as may be approved by EGAT.

The conditions of guarantor's obligations in the maintenance security shall include, inter alia; the following :

1. The guarantor shall unconditionally guarantee, as primary obligor and not as surety merely, payment of any obligations, damages, liquidated damages, performance penalties, or expenses for which the Contractor may become liable to EGAT.
2. No extension of time, change in, addition to, or other modification of the terms of the Contract or Work to be performed thereunder, or of the Specifications or other Contract Documents shall in anyway release the guarantor from any liability under the maintenance security, and the guarantor shall thereby waive notice of any such extension of time, change, addition or modification.
3. The maintenance security(ies) shall be valid and remain in full effect for a period as specified in Article F-17.a. of the Contract from the day immediately following the date of provisional acceptance of the Work until all obligations of the Work or all obligations of the work guaranteed for the period as specified in Article F-17.a. on the part of the Contractor under the Contract have been fulfilled.

Unless and until an official receipt is issued in respect to a maintenance security deposit, EGAT will not recognize or accept any such deposit as fulfilling the requirements of this Article. Failure to deposit a maintenance security at the time specified above in this Article or such extended time as may be approved by EGAT shall be a breach of this Contract and EGAT may, at its discretion, retain the payment of the last instalment of the total Contract Price.

If any maintenance security furnished under this Article shall become unacceptable to EGAT, or if any guarantor shall fail to furnish reports as to guarantor's financial condition from time to time, as requested by EGAT, the Contractor shall promptly

furnish such additional or alternative maintenance security as may be necessary to satisfy the Contract requirements for a maintenance security.

In the event of any default or breach of this Contract on the part of the Contractor, EGAT may convert into money any maintenance security which does not consist of money, and the proceeds shall be deemed to be a cash deposit under this Article. EGAT shall not be liable for any cost, expenses and/or loss resulting from the conversion of any maintenance security deposit into money as herein provided. The Contractor shall bear the cost of the maintenance security.

The maintenance security, in case of a bank guarantee, or letter of guarantee, shall be in conformity with the following specimen.

DRAFT

## **SPECIMEN OF MAINTENANCE GUARANTEE**

(For Work with One-Year Guarantee Period)

To :

Date \_\_\_\_\_

Electricity Generating Authority of Thailand  
Bangkruai, Nonthaburi 11130,  
Thailand

Re : Maintenance Security for Contract

No. EGAT \_\_\_\_\_

Gentlemen :

In accordance with the provision of the Contract for design, manufacture, supply, construction and installation of \_\_\_\_\_ No. EGAT \_\_\_\_\_ dated \_\_\_\_\_ (hereinafter referred to as the Contract), the contents of which have been noted by us that Messrs. \_\_\_\_\_ (hereinafter referred to as the Contractor) has to deposit with the Electricity Generating Authority of Thailand, (hereinafter referred to as EGAT) a Maintenance Security to guarantee the proper performance during the maintenance period as stipulated in Article F-17. Maintenance Guarantee of the Contract in the amount of \_\_\_\_\_ (in words : \_\_\_\_\_)

which is ten (10) per cent, round up to the nearest whole number, of the total Contract Price of the said Work, we, the \_\_\_\_\_ as instructed by the Contractor, agree unconditionally to irrevocably guarantee as primary Obligor, the payment to EGAT at its first demand without whatsoever right of objection on our part and without its first filing claim to the Contractor giving EGAT the right of claim for penalty, damages, liquidated damages or any expenses for which the Contractor may become liable to EGAT under the Contract.

We further agree that no extension of time, change in, addition to or other modification of terms of the Contract or Work to be performed thereunder, or of the Specifications or other Contract Documents, which may be made between EGAT and the Contractor, shall in any way release us from any liability under the Maintenance Security, and we shall thereby waive notice of any such extension of time, change, addition or modification.

This Maintenance Security shall be valid and remain in full effect for a period of one (1) Year from the day immediately following the date of provisional acceptance of the Work as specified in Article F-14. Provisional Acceptance Certificate until the date of final acceptance of the Work as designated in Article F-16. Final Acceptance Certificate and all obligations on the part of the Contractor under the Contract have been fulfilled. If necessary, this Maintenance Security shall be extended as specified in Article F-17. Maintenance Guarantee.

Yours very truly,

\_\_\_\_\_  
Authorized signature



## **SPECIMEN OF MAINTENANCE GUARANTEE**

(For Work with Three-Year Guarantee Period)

To :

Date \_\_\_\_\_

Electricity Generating Authority of Thailand  
Bangkruai, Nonthaburi 11130,  
Thailand

Re : Maintenance Security for Contract

No. EGAT \_\_\_\_\_

Gentlemen :

In accordance with the provision of the Contract for design, manufacture, supply, construction and installation of \_\_\_\_\_ No. EGAT \_\_\_\_\_ dated \_\_\_\_\_ (hereinafter referred to as the Contract), the contents of which have been noted by us that Messrs. \_\_\_\_\_ (hereinafter referred to as the Contractor) has to deposit with the Electricity Generating Authority of Thailand, (hereinafter referred to as EGAT) a Maintenance Security to guarantee the proper performance during the maintenance period as stipulated in Article F-17. Maintenance Guarantee of the Contract in the amount of \_\_\_\_\_ (in words : \_\_\_\_\_)

which is ten (10) per cent, round up to the nearest whole number, of the total Contract Price of the said Work, we, the \_\_\_\_\_ as instructed by the Contractor, agree unconditionally to irrevocably guarantee as primary Obligor, the payment to EGAT at its first demand without whatsoever right of objection on our part and without its first filing claim to the Contractor giving EGAT the right of claim for penalty, damages, liquidated damages or any expenses for which the Contractor may become liable to EGAT under the Contract.

We further agree that no extension of time, change in, addition to or other modification of terms of the Contract or Work to be performed thereunder, or of the Specifications or other Contract Documents, which may be made between EGAT and the Contractor, shall in any way release us from any liability under the Maintenance Security, and we shall thereby waive notice of any such extension of time, change, addition or modification.

This Maintenance Security shall be valid and remain in full effect for a period of three (3) Years from the day immediately following the date of provisional acceptance of the Work as specified in Article F-14. Provisional Acceptance Certificate until the date of final acceptance of the Work as designated in Article F-16. Final Acceptance Certificate and all obligations on the part of the Contractor under the Contract have been fulfilled. If necessary, this Maintenance Security shall be extended as specified in Article F-17. Maintenance Guarantee.

Yours very truly,

\_\_\_\_\_  
Authorized signature

## Drawings and Documents Required for Each Particular Equipment

### Schedule H: Optical Fiber and Line Accessories

#### Communication System Part

##### (I) Equipment

Equipment	Manufacturing & Delivery Schedule	Specification	Test Procedure	Test Schedule	Test Report	Instruction Manual	Drawing or Document	
							Print	CD-ROM
Composite overhead ground wire with optical fiber (OPGW)	X	X	X	X	X	-	X	-
Non-metallic optical fiber cable (OFC)	X	X	X	X	X	-	X	-
Rigid steel conduit	-	X	-	-	-	-	X	-
EFLEX and/or HDPE conduit	-	X	-	-	-	-	X	-
Joint box	-	X	-	-	-	-	X	-
Rack cabinet	-	X	-	-	-	-	X	-
Fiber frame termination cabinet with cable tray (FTC)	-	X	-	-	-	-	X	-
36 pigtails	-	X	-	-	-	-	X	-

(II) System configuration

Description	Manufacturing & Delivery Schedule	Final Design Data	Test Procedure	Test Schedule	Test Report	Instruction Manual	Drawing or Document	
							Print	CD-ROM
Breakdown quantity of OPGW and accessories	-	X	-	-	-	-	X	-
Location diagram for joint box	-	X	-	-	-	-	X	-
Position of OPGW stringing	-	X	-	-	-	-	X	-
Route of direct buried cable and installation detail	-	X	-	-	-	-	X	-

**SECTION G**  
**LOCAL CONDITIONS**

## **LOCAL CONDITIONS**

### **G-1. General**

The Contractor shall be deemed to have carefully examined the Contract Documents and also to have carefully studied all conditions affecting the execution of the Works and to have formulated an estimate of facilities available and needed.

### **G-2. Construction and Installation Program**

Within thirty (30) Days after the date of confirmation of Letter of Award of Contract the Contractor shall furnish EGAT a complete construction and installation program providing for the orderly performance of the Work, showing in detail the proposed program of operations, including design, purchase and delivery of Equipment, as well as the construction and installation. The construction and installation program shall be in such form and in such detail as to show properly the sequence of operations, the period of time required for completion of the Work under each item, or group of similar items of the Schedule. Revised construction and installation programs shall be submitted at intervals of not more than one (1) Month, and in addition thereto, the Contractor shall immediately advise EGAT of any proposed changes in the construction and installation program. Revised construction and installation programs shall show construction and installation operations for each item of Work from the time Work under the Contract started to the anticipated completion date, thereby indicating the periods during which Work was previously under way, as well as estimated future periods of construction and installation operations.

### **G-3. Safety Program**

Prior to starting construction and installation, the Contractor shall submit a safety plan to EGAT for approval. This plan shall include, as a minimum, a safety manual, a program of safety meetings and the designation of a safety supervisor.

The Contractor's safety manual should include a statement of safety policy and objectives and basic elements of safety. Also included should be guidelines for personal safety, protection of the public, accident prevention, house keeping at the sites, first aid, maintenance and repair of tools and equipment and precautions to be observed when excavation, shoring, driving piles, erecting towers and stringing wire.

The program of safety meetings shall be carried out through the time of construction and installation. The name and qualifications of the designated safety supervisor shall be stated.

Regulations of Safety for Construction Work in the Thai language are attached at the end of this Section.

Prior to the commencement of the Work, the Contractor shall submit Table 2. Contractor's Safety Information to EGAT for approval. The Contractor shall also observe and comply with Regulations of Safety for Construction Work in the Thai language and Table 1. EGAT's Safety Criteria and Conditions attached at the end of this Section.

EGAT reserves the right to evaluate the Contractor as detailed in Table 3. Contractor Safety Evaluation Checklist attached at the end of this Section.

**G-4. Quality Assurance Program**

Within sixty (60) Days after confirmation of Letter of Award of Contract the Contractor shall submit his program for quality assurance to EGAT for approval. This program shall include a description of the organization of the Contractor's quality assurance team and program, his control and checking procedures for check surveys, subsoil investigations, preparation of shop and construction drawings and incidental design; document control and contract administration. For procured Equipment, the program for controlling quality through process control, inspections, test control and the procedures for correcting possible production of non-conforming articles shall be included. For construction and installation, the Contractor shall propose procedures for controlling the quality of foundations, tower erection, stringing and testing. For the overall project, the Contractor shall describe his planned reports and quality assurance records.

**G-5. Cooperation with Other Contractors**

The Contractor shall cooperate with any other contractors for, and workmen of, EGAT who may be performing work at or near the Work hereby contracted, and shall conduct the operations so as to interfere to the least possible extent with the work of such other contractors, or workman. Any differences or conflict which may arise between the Contractor and other such contractors or workmen will be adjusted and determined by EGAT. If the Work of the Contractor is delayed, as determined by EGAT, because of any acts or omissions of such other contractors or workmen, the Contractor shall have no claim against EGAT on that account other than an extension of time.

**G-6. Housing and Other Facilities**

The Contractor shall be responsible for housing his personnel and shall provide his own office space and office facilities, with cost borne by the Contractor.

The Contractor shall also provide minimum office space of 4 meters by 6 meters in his temporary building at each site for use by EGAT. This office space shall include the following facilities :

4-drawer filing cabinet	1	each
2-door storage cabinet (approx. 91 cmW x 182 cmH x 45 cmD)	1	each
Desk and Chair	3	sets

Facsimile machine	1	each
New computer and printer (with internet system)	1	set
Refrigerator	1	each
White board	1	each
Board showing work progress	1	each

The Contractor shall be responsible for the cost of maintenance services and fee for internet system. All expenses shall be included in the Price Schedule.

The Contractor shall provide the following for EGAT to inspect the work of the Contractor throughout the period of the Contract :

- a. four-wheel-drive, four doors vehicles, at least one ton capacity, 2000 cc. nominal, gasoline engine or 2500 cc. nominal diesel engine, equipped with air-conditioner. The vehicles shall be in good condition which shall be approved by EGAT. In case used vehicles are proposed, the used period shall not be more than two years.
- b. mobile telephones.

The provision of vehicles and mobile telephones shall meet the following requirements :

Transmission Line Length (Kilometers)	Vehicles (Units)	Mobile Telephones (Sets)
- less than or equal to 30.0 km	2	2
- more than 30.0 km but less than or equal to 60.0 km	3	2
- more than 60.0 km but less than or equal to 100.0 km	4	3
- more than 100.0 km but less than or equal to 150.0 km	5	4
- more than 150.0 km	6	4

In addition, the Contractor shall also arrange vehicle-drivers for EGAT and the vehicles shall be provided with first-class vehicle insurance. All the vehicles shall be submitted to EGAT at least two weeks before starting of check survey.

All expenses incurred in respect of the vehicles including cost of fuel, vehicle maintenance and all costs of services and charges shall be included in the Price Schedule. However, each vehicle shall not be used more than six thousand (6,000) kilometers per month. In case the usage exceeds the limitation, EGAT will reimburse the Contractor for the extra expenses at the rate 3 (three) Baht per kilometer.

The monthly fee of each mobile telephone shall be borne by the Contractor at the maximum amount of two thousand (2,000) Baht. EGAT will be responsible for the actual amount exceeding the limitation.

The usage of both vehicles and mobile telephones shall be only for the Work under the Contract.

The Contractor shall be responsible for removal and return of the temporary buildings and all facilities after completion of the Work at his own expenses.

**G-7. Construction and Storage Areas**

The Contractor shall be responsible for providing his own construction and storage facilities. When acquiring land, the Contractor shall make all necessary arrangements with land owners and shall pay all rentals and other costs connected therewith. The location of all construction and storage areas is subject to the approval of EGAT.

The Contractor shall be responsible for the security and protection of all Equipment, including those supplied by EGAT, within the construction and storage areas. Necessary fence, roof, platform or other means shall be provided for protection of the Equipment from loss or damage caused by water or other substances. The construction and maintenance of such storage areas shall be subject to the approval, inspection and direction of EGAT. All costs incurred in protecting the Equipment shall be borne by the Contractor.

**G-8. Right-of-Way and Access Road**

EGAT will provide all right-of-way for the transmission line. However, EGAT reserves the right not to provide the right-of-way continuously. Since the Contractor acknowledges that EGAT may not be able to acquire the right-of-way for the whole transmission line at one time, the Contractor has the obligations to adjust and monitor his construction program and resources to conform to the portion of the right-of-way provided by EGAT and include all expected expenses related to the problems that may be encountered in the Contract price. The Contractor shall also adjust his construction Equipment and his crew to conform to the adjusted construction program.

In the event that EGAT fails to provide the right-of-way to the Contractor according to the construction progress of work, the Contractor may request to be entitled to recover such cost from EGAT in accordance with Article E-24. Termination and Suspension of Contract.

The Contractor shall use the right-of-way as provided by EGAT for access to work where it affords feasible access. EGAT assumes no responsibility for the condition or maintenance of any proposed access route, or of any existing road or structure thereon that may be used by the Contractor for performance of the Work under the Contract Documents. Any and all work required along the routes to provide suitable access shall be performed by the Contractor at the Contractor's expense, and cost of all such work shall be borne by the Contractor.



The Contractor shall clear only those access routes approved by EGAT. The Contractor shall not construct roadways except where roadways are absolutely necessary for the movement of the Contractor's equipment. Movement of the Contractor's equipment shall be restricted to the access routes clearly marked by the Contractor.

New roads shall not be wider than necessary but shall be determined by need due to equipment size and shall be constructed with the minimum possible clearing and soil disturbance.

Where unavoidable, clearing for roads in shrub areas shall consist of crushing rather than uprooting brush. Unless shrubs and trees within the construction area interfere excessively with equipment movement during construction, such vegetation shall not be removed but shall be marked for preservation.

**G-9. Protection of Real Estate Crossed by Right-of-Way**

The Contractor shall limit the movement of his crews and equipment to the right-of-way, and the access routes approved by EGAT, so as to minimize damage to crops and property, and shall endeavor to avoid marring the lands. Ruts and scars shall be obliterated, damage to ditches, tile drains, terraces, roads, and other features of the land shall be corrected, and the land shall be restored as nearly as practicable to its original condition before final acceptance of the Work.

The Contractor shall be liable directly to EGAT for any excessive or unnecessary damage to crops or lands resulting from his operations on right-of-way and deduction will be made from payment due, the Contractor to cover the amount of such excess or unnecessary damage, as determined by EGAT. The Contractor shall be liable to owners or occupants of land or properties outside the right-of-way for all damages caused by his operation including damage caused by straying livestock, and he shall promptly make due compensation thereof.

All expenses incurred in the performance of any work described in this Article shall be borne by the Contractor.

**G-10. Safety of the Public**

The Contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient red lights, danger signals, and signs, and take all necessary precautions for the protection of the Work and safety of the public. Roads and highways closed to traffic shall be protected by effective barricades on which shall be placed acceptable warning and detour signs. All barricades and obstructions shall be illuminated at night and all lights shall be kept burning from one hour before sunset until one hour after sunrise. The costs of all work required by this Article shall be borne by the Contractor.

#### **G-11. Existing Fences**

Where it is necessary to operate equipment through existing fences, the Contractor shall install suitable temporary gates. The temporary gates shall be constructed of materials and to standards at least equal to those of the existing fence. Before cutting the fences for the installation of temporary gates, the Contractor shall install adequate braces and additional posts, if necessary, on each side of the opening and shall fully anchor the fence so that all wires will maintain their original tension after the opening is cut. Except when equipment is passing, such gates shall be kept closed. After completion of the Work, the fence shall be restored as nearly as practicable to its original condition. Deviation from the above requirements will be permitted only where the Contractor furnishes advanced written approval from the landowner or landowners of a different method of operation.

Where it is necessary for the Contractor to remove or to alter portions of existing fences to permit construction, temporary fence protection shall be provided at all times during construction, and upon completion of the construction, the fence shall be rebuilt in its original or relocated position.

Gates and fences must remain closed except to allow the passage of equipment during construction. At times when a gate is opened or a fence is lowered, the Contractor must have a man in constant attendance until such time as the gate is closed or the fence is returned to its normal position. All damage incurred by not complying with these requirements, such as, but not limited to, the straying or loss of livestock, or injury thereto, will be the sole responsibility of the Contractor.

The cost of all work herein described shall be borne by the Contractor. Should the Contractor refuse or neglect to perform any work required by the above provisions within twenty-four hours after notification by EGAT to do so, EGAT reserves the right to perform the work and the cost thereof will be deducted from payments due to the Contractor.

#### **G-12. Highways, Railroads, Communication and Power Lines**

The Contractor shall conduct his operations so as not to close or obstruct any portion of any highway, road, alley or street until he has obtained permits from the appropriate authorities.

The Contractor shall use all necessary and practical precautionary measures to prevent interruption to service on all railroads, communication and power lines existing on the date of technical proposal opening to be crossed by the transmission line during construction. The Contractor shall obtain all required permits and shall notify the proper authorities not less than one week before beginning the work at any such crossings. The Contractor shall execute the work in a manner that is mutually agreeable to all parties involved and shall provide all necessary equipment and personnel to accomplish the crossings in the agreed manner.

The Contractor shall notify the owners of such facilities of any damage which is his responsibility and shall promptly settle proper claims. Pending settlement of such claims by the contractor, an appropriate sum as determined by EGAT may be withheld from payments due to the Contractor until the matter is settled.

The cost of providing and maintaining all necessary or required watchmen, signals, guards, and temporary structures; of making any necessary repairs, replacements, or similar operations; and all or any other costs required by this Article, including those costs associated with the de-energizing of power lines, shall be borne by the Contractor.

**G-13. Utilities for Construction Purposes**

The Contractor shall make all necessary arrangements and shall provide all necessary electric power, water, etc. for construction purposes. The cost of such utilities shall be borne by the Contractor.

**G-14. Site Clean-up and Restoration**

The Contractor shall keep the various work sites, camps, and other places used for the work in a clean condition. After completion of Work at any particular site, it shall be cleaned up and debris and unused materials shall all be incinerated or disposed of at places which will not be unsightly or objectionable to the inhabitants of the area.

Damages inflicted to roads, bridges, buildings, fences and other properties during construction shall be restored to the original conditions or compensation made therefor. Such restoration or compensation, and all other indemnification for which the Contractor is responsible shall be completely settled and disposed of before the Work is delivered to EGAT for acceptance.

## ข้อกำหนดสำหรับการดำเนินงานด้านความปลอดภัยในการทำงานเกี่ยวกับงานก่อสร้าง

### ๑. วัตถุประสงค์

เพื่อเป็นประโยชน์ต่อผู้ว่าจ้าง ผู้รับจ้าง ผู้รับเหมา และผู้รับเหมาช่วง ที่จะนำไปใช้เป็นเกณฑ์ปฏิบัติในการดำเนินงานด้านความปลอดภัยอาชีวอนามัยและสภาพแวดล้อมในการทำงาน

### ๒. ขอบข่าย

ข้อกำหนดนี้ครอบคลุมถึง การออกข้อกำหนด (Specification) การสอบราคาและการประกวดราคาสำหรับผู้รับจ้าง ผู้รับเหมา และผู้รับเหมาช่วง ที่เกี่ยวข้องกับการก่อสร้างทั่วไปของการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.)

### ๓. นิยาม

“งานก่อสร้างทั่วไป” หมายถึง การประกอบกิจการเกี่ยวกับการก่อสร้างสิ่งก่อสร้างทุกชนิด ซึ่งครอบคลุมไปถึงการปรับปรุงแก้ไขต่อเติม ซ่อมแซม ซ่อมบำรุง ดัดแปลง เคลื่อนย้าย หรือการรื้อถอนทำลายสิ่งก่อสร้างนั้นด้วย

“เขตก่อสร้าง” หมายถึง พื้นที่ที่ดำเนินการก่อสร้าง รวมทั้งพื้นที่โดยรอบบริเวณซึ่งผู้ว่าจ้างได้กำหนดขึ้น

“เขตอันตราย” หมายถึง บริเวณที่เป็นสถานที่ที่ใช้ในการก่อสร้าง หรือพื้นที่ที่ใช้เครื่องจักรหรืออุปกรณ์ไฟฟ้าเพื่อการก่อสร้าง พื้นที่ที่เป็นทางลำเลียงวัสดุเพื่อการก่อสร้าง หรือพื้นที่ที่ใช้เป็นสถานที่เก็บเชื้อเพลิง วัตถุระเบิด หรือวัสดุก่อสร้าง

“เจ้าหน้าที่ความปลอดภัยในการทำงาน (จป.)” หมายถึง บุคคลที่ผู้รับจ้างแต่งตั้งให้เป็นเจ้าหน้าที่ความปลอดภัยในการทำงานระดับหัวหน้างาน ระดับบริหาร ระดับเทคนิค ระดับเทคนิคขั้นสูง และ/หรือระดับวิชาชีพ โดยมีคุณสมบัติตามหลักเกณฑ์ที่ประกาศไว้ในกฎกระทรวง กำหนดมาตรฐานในการบริหารและการจัดการด้านความปลอดภัย อาชีวอนามัยและสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๔๔

“ผู้ควบคุมงานด้านความปลอดภัย กฟผ.” หมายถึง เจ้าหน้าที่ความปลอดภัย กฟผ. ผู้ตรวจสอบงานของ กฟผ. (Inspector) หรือผู้ปฏิบัติงานของ กฟผ. ที่ได้รับมอบหมายจากผู้บังคับบัญชาให้มีหน้าที่ควบคุมดูแล ด้านความปลอดภัยในโครงการหรือเฉพาะคราวนั้น

“ผู้รับจ้างหรือผู้รับเหมา” หมายถึง บุคคลหรือนิติบุคคลที่ตกลงทำงานก่อสร้างให้กับ กฟผ. ตามสัญญาก่อสร้าง

“ผู้รับเหมาช่วง” หมายถึง บุคคลหรือนิติบุคคลที่ตกลงทำงาน โดยรับจะดำเนินงานทั้งหมดหรือแต่บางส่วนในงานใดในความรับผิดชอบของผู้รับจ้างหรือผู้รับเหมา เพื่อประโยชน์แก่ผู้ว่าจ้าง (กฟผ.) โดยได้รับอนุญาตจาก กฟผ. เป็นลายลักษณ์อักษร และหมายความรวมถึงผู้ซึ่งทำสัญญากับผู้รับเหมาช่วงเพื่อรับช่วงงานในความรับผิดชอบของผู้รับเหมาช่วง ทั้งนี้ ไม่ว่าจะได้รับช่วงกันกี่ช่วงก็ตาม

**หมายเหตุ :** กรณีไม่มีคำนิยามให้อ้างอิงตามคำนิยามของกฎกระทรวงแรงงานและสวัสดิการสังคมเป็นหลัก

### ๔. การดำเนินงานควบคุมความปลอดภัย

#### ๔.๑ ข้อกำหนดทั่วไปสำหรับการดำเนินงานด้านความปลอดภัย

๔.๑.๑ ผู้รับจ้างจะต้องปฏิบัติตามข้อกำหนดทั่วไปสำหรับการดำเนินงานด้านความปลอดภัยและข้อเสนอแนะด้านความปลอดภัยของผู้ควบคุมงานด้านความปลอดภัย กฟผ. อย่างเคร่งครัด

๔.๑.๒ ผู้รับจ้างจะต้องเสนอรายชื่อเจ้าหน้าที่ความปลอดภัยที่มีคุณสมบัติครบตามที่กฎหมายกำหนด

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๔.๑.๓ บุคลากรด้านความปลอดภัย

ผู้รับจ้างจะต้องจัดหาและเสนอรายชื่อเจ้าหน้าที่ความปลอดภัยตามกฎกระทรวงแรงงาน และสวัสดิการสังคม พร้อมใบแสดงคุณสมบัติแต่ละระดับที่ผ่านการอบรมจากกรมสวัสดิการและคุ้มครองแรงงาน ก่อนการเริ่มดำเนินงานก่อสร้าง

๔.๑.๓.๑ ในกรณีที่มีลูกจ้าง ๒-๑๙ คน ต้องมี

- (๑) เจ้าหน้าที่ความปลอดภัยระดับบริหาร
- (๒) เจ้าหน้าที่ความปลอดภัยระดับหัวหน้างาน

๔.๑.๓.๒ ในกรณีที่มีลูกจ้าง ๒๐-๔๙ คน ต้องมี

- (๑) เจ้าหน้าที่ความปลอดภัยระดับบริหาร
- (๒) เจ้าหน้าที่ความปลอดภัยระดับหัวหน้างาน
- (๓) เจ้าหน้าที่ความปลอดภัยระดับเทคนิค หรือ เทคนิคขั้นสูง หรือ วิชาชีพ

๔.๑.๓.๓ ในกรณีที่มีลูกจ้าง ๕๐-๙๙ คน ต้องมี

- (๑) เจ้าหน้าที่ความปลอดภัยระดับบริหาร
- (๒) เจ้าหน้าที่ความปลอดภัยระดับหัวหน้างาน
- (๓) เจ้าหน้าที่ความปลอดภัยระดับเทคนิคขั้นสูง หรือ วิชาชีพ

๔.๑.๓.๔ ในกรณีที่มีลูกจ้างตั้งแต่ ๑๐๐ คน ขึ้นไป ต้องมี

- (๑) เจ้าหน้าที่ความปลอดภัยระดับบริหาร
- (๒) เจ้าหน้าที่ความปลอดภัยระดับหัวหน้างาน
- (๓) เจ้าหน้าที่ความปลอดภัยระดับวิชาชีพ ประจำและปฏิบัติงานเต็มเวลา

๔.๑.๓.๕ เจ้าหน้าที่ความปลอดภัยจะต้องติดต่อประสานงานด้านความปลอดภัย (ในกรณี มีหรือพบสภาพของความรุนแรงบริเวณที่มีการทำงานของลูกจ้าง) กับเจ้าหน้าที่ความปลอดภัยของ กฟผ. อย่างสม่ำเสมอ และในข้อตกลงใดๆ ให้ถือว่าเป็นภาระผูกพันที่ผู้รับจ้างต้องปฏิบัติ เพื่อให้เกิดความปลอดภัย อย่างรวดเร็ว

๔.๑.๓.๖ เจ้าหน้าที่ความปลอดภัยจะต้องจัดประชุมด้านความปลอดภัยในงานก่อสร้าง ร่วมกับเจ้าหน้าที่ความปลอดภัยของ กฟผ. อย่างน้อยเดือนละครั้ง และหากมีผู้รับจ้างเหมาช่วง ต้องให้ผู้รับจ้าง เหมาช่วงหรือตัวแทนเข้าประชุมด้วยทุกงานที่รับจ้างเหมาช่วง

๔.๑.๔ ผู้รับจ้างจะต้องกำหนดให้ผู้รับเหมาช่วง มีหน้าที่ต้องปฏิบัติตามความปลอดภัยตาม กฎหมาย รวมทั้งข้อกำหนดเพิ่มเติมของ กฟผ. ทั้งนี้ เจ้าหน้าที่ความปลอดภัยของผู้รับจ้างต้องสามารถ ประสานงานและสั่งการผู้รับเหมาช่วงได้ตลอดเวลา และถือว่าการดำเนินการใดๆ ก็ตามของผู้รับเหมาช่วง อยู่ในความรับผิดชอบของผู้รับจ้าง

๔.๑.๕ กรณีที่ กฟผ. พบเห็นว่าสภาพการณ์ใด หรือการกระทำใดไม่ปลอดภัยต่อการปฏิบัติงาน และได้แจ้งเป็นลายลักษณ์อักษรให้ผู้รับจ้างดำเนินการแก้ไขแล้ว หากผู้รับจ้างดำเนินการแก้ไขล่าช้ากว่าที่ กฟผ. กำหนด กฟผ. อาจจะเข้าดำเนินการแก้ไขหรือจ้างบุคคลอื่นดำเนินการแก้ไข ทั้งนี้ ผู้รับจ้างต้องรับผิดชอบต่อ ค่าใช้จ่ายที่เกิดขึ้นทั้งหมดและยินยอมให้ กฟผ. หักค่าใช้จ่ายทั้งหมดออกจากค่างาน (เงินพึงได้) ประจาวัดนั้น หรือรอดัดไปจนครบจำนวน

๔.๑.๖ ในกรณีที่ กฟผ. พบว่าอาจเกิดอุบัติเหตุร้ายแรงต่อบุคคลหรือทรัพย์สินในงานก่อสร้าง ซึ่งมีสาเหตุมาจากความผิดของผู้รับจ้าง กฟผ. มีอำนาจสั่งให้แก้ไขในทันที หรือสั่งให้หยุดงานบางส่วนหรือ ทั้งหมดได้ด้วยวาจา และจะมีบันทึกแจ้งให้ผู้รับจ้างทราบเป็นลายลักษณ์อักษรในภายหลัง ซึ่งกรณีเช่นนี้ ผู้รับจ้างจะเรียกร้องค่าเสียหายอย่างหนึ่งอย่างใดจาก กฟผ. ไม่ได้ ผู้รับจ้างไม่มีสิทธิที่จะขอขยายกำหนดเวลา แล้วเสร็จของงาน หรือขยายเวลากำหนดส่งมอบงานตามสัญญาด้วยเหตุดังกล่าว

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๔.๑.๗ หากบุคลากรของผู้รับจ้างไม่สวมใส่อุปกรณ์ความปลอดภัยส่วนบุคคลที่เหมาะสมกับลักษณะงาน หรือไม่ปฏิบัติตามกฎความปลอดภัยหรือขั้นตอนการปฏิบัติเพื่อความปลอดภัย ผู้ควบคุมงานด้านความปลอดภัย กฟผ. มีอำนาจสั่งให้บุคลากรนั้นหยุดการทำงานชั่วคราวได้ จนกว่าผู้รับจ้างจะได้ดำเนินการแก้ไขจนเป็นที่เรียบร้อย

#### ๔.๒ ก่อนการปฏิบัติงาน

##### ๔.๒.๑ แผนงานด้านความปลอดภัยในการทำงาน สำหรับประเภทของงานก่อสร้าง ดังต่อไปนี้

(๑) งานอาคารขนาดใหญ่ ที่มีพื้นที่อาคารรวมกันทุกชั้นหรือชั้นหนึ่งชั้นใดในหลังเดียวกัน เกิน ๒,๐๐๐ ตารางเมตร

(๒) อาคารที่มีความสูงตั้งแต่ ๑๕ เมตรขึ้นไป และมีพื้นที่อาคารรวมกันทุกชั้นหรือชั้นหนึ่งชั้นใด ในหลังเดียวกันเกิน ๑,๐๐๐ ตารางเมตร

(๓) งานสะพานที่มีช่วงความยาวเกิน ๓๐ เมตร หรืองานสะพานข้ามทางแยก หรือทางยกระดับ หรือสะพานกลับรถยนต์ หรือทางแยกต่างระดับ

(๔) งานโครงสร้างที่มีโครงสร้างเหนือพื้นดินที่มีช่วงความยาวเกิน ๓๐ เมตร

(๕) งานขุดหรือซ่อมแซม หรือรื้อถอนระบบสาธารณูปโภคที่ลึกเกิน ๓ เมตร

(๖) งานก่อสร้างที่มีงบประมาณค่าก่อสร้างเกิน ๓๐๐ ล้านบาท

(๗) งานอุโมงค์หรือทางลอด

(๘) งานก่อสร้างสถานีไฟฟ้าแรงสูงและอาคารควบคุม

ผู้รับจ้างต้องเสนอแผนงานความปลอดภัยในการทำงานให้ กฟผ. เห็นชอบก่อนจะเริ่มงานอย่างน้อย ๑๕ วัน ซึ่งอย่างน้อยประกอบด้วย

๔.๒.๑.๑ จัดให้มีข้อบังคับและคู่มือว่าด้วยความปลอดภัยในการทำงานไว้ในสถานประกอบการ โดยการกำหนดขั้นตอนและวิธีการปฏิบัติงานที่ปลอดภัยเสนอให้ กฟผ. พิจารณา

๔.๒.๑.๒ จัดให้มีนโยบายด้านความปลอดภัยในการทำงานและโครงสร้างการบริหารงานความปลอดภัยของโครงการก่อสร้าง

๔.๒.๑.๓ จัดให้มีการประเมินความเสี่ยงโครงการที่ดำเนินการ รวมทั้งมาตรการป้องกันและขั้นตอนการทำงานอย่างปลอดภัย รวมทั้งจัดทำแผนรองรับเหตุฉุกเฉินกรณีเกิดอุบัติเหตุในการทำงาน

๔.๒.๑.๔ จัดให้มีผังบริเวณงานก่อสร้าง แสดงถึงรั้วกันบริเวณก่อสร้าง เขตอันตราย การจราจร ที่กองวัสดุ ออฟฟิศสนาม ห้องน้ำและห้องส้วม จุดติดตั้งเครื่องดับเพลิงชนิดเคลื่อนที่ ถังน้ำดื่ม ป้ายต่างๆ ที่จอดรถ เครื่องจักรกล ฯลฯ

๔.๒.๑.๕ จัดให้มีแผนการอบรมแนะนำแก่ลูกจ้างของผู้รับจ้างเกี่ยวกับเรื่องความปลอดภัยในการทำงาน การปฐมพยาบาล การระงับอัคคีภัย ก่อนเริ่มงาน และ/หรือเมื่อมีลูกจ้างใหม่ และต้องแจ้งให้ผู้ควบคุมงานด้านความปลอดภัย กฟผ. ทราบ รวมถึงการปฐมพยาบาลด้านความปลอดภัยในการทำงานให้ลูกจ้างใหม่ และ/หรือลูกจ้างที่เปลี่ยนงานใหม่

๔.๒.๑.๖ จัดให้มีแผนงานการตรวจสอบอุปกรณ์ เครื่องมือ เครื่องจักร ฯลฯ

๔.๒.๑.๗ จัดให้มีขั้นตอนปฏิบัติการจัดทำรายงานการประสบอันตราย การเจ็บป่วย และการตรวจสอบหาสาเหตุ รวมถึงการป้องกันเหตุเดือดร้อนรำคาญ (ถ้ามี) ตลอดจนแผนการตรวจสอบ วิเคราะห์ และรายงานอุบัติเหตุที่เกิดขึ้น

๔.๒.๑.๘ จัดให้มีแผนงานกิจกรรมด้านความปลอดภัยอื่นๆ ตามที่กฎหมายกำหนด

๔.๒.๑.๙ จัดให้มีตารางการกำหนดเวลาทำงานด้านความปลอดภัยในเรื่องดังต่อไปนี้

(๑) สถานที่ก่อสร้าง

(๑.๑) การกำหนดบริเวณเขตก่อสร้าง โดยทำรั้วสูงไม่น้อยกว่า ๒ เมตร ที่มั่นคง แข็งแรงไว้ตลอดแนวเขตก่อสร้าง หรือกั้นเขตก่อสร้างด้วยวัสดุที่เหมาะสมตามลักษณะงาน

(๑.๒) การจัดทำป้าย “เขตก่อสร้าง” แสดงให้เห็นชัดเจน

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(๒) ภายในบริเวณก่อสร้าง

(๒.๑) การกำหนดเขตอันตรายในเขตก่อสร้าง โดยจัดทำรั้วหรือกั้นเขตด้วยวัสดุที่เหมาะสม

(๒.๒) การจัดทำป้าย “เขตก่อสร้าง” แสดงให้เห็นชัดเจน และในเวลา กลางคืนให้มีสัญญาณไฟสีส้มตลอดเวลา

(๒.๓) ห้ามลูกจ้างพักอาศัยในเขตก่อสร้าง

(๓) ไฟฟ้าชั่วคราว และระบบแสงสว่าง

(๓.๑) การติดตั้งแผงไฟฟ้าชั่วคราว สายเมนไฟฟ้า

(๓.๒) การติดตั้งไฟแสงสว่าง เช่น บริเวณทางเข้า ป้ายเตือนเขต

ก่อสร้างบริเวณที่ทำงาน

(๔) ภายในอาคารที่ก่อสร้าง

(๔.๑) การติดตั้งนั่งร้าน

(๔.๒) การติดตั้งตาข่ายคลุมกันวัสดุตกหล่นปิดรอบนอกนั่งร้าน และ  
แผงกันวัสดุตกหล่นได้นั่งร้านชั้นที่ก่อนถึงระดับพื้นดิน

(๔.๓) การติดตั้งราวกันตก

(๔.๔) การติดตั้งป้ายเตือน ป้ายบังคับ

๔.๒.๒ แผนงานด้านความปลอดภัยในการทำงาน สำหรับงานก่อสร้างทั่วไป

ผู้รับจ้างต้องเสนอแผนงานความปลอดภัยในการทำงานให้ กฟผ. เห็นชอบก่อนจะเริ่มงาน  
อย่างน้อย ๑๕ วัน ซึ่งอย่างน้อยต้องประกอบด้วย

๔.๒.๒.๑ จัดให้มีข้อบังคับและคู่มือว่าด้วยความปลอดภัยในการทำงานไว้ในสถานประกอบ  
กิจการ โดยกำหนดขั้นตอนและวิธีการปฏิบัติงานที่ปลอดภัยเสนอให้ กฟผ. พิจารณา

๔.๒.๒.๒ จัดให้มีนโยบายด้านความปลอดภัยในการทำงาน และโครงสร้างการบริหารงาน  
ความปลอดภัยของโครงการก่อสร้าง

๔.๒.๒.๓ จัดให้มีผังบริเวณงานก่อสร้าง แสดงถึงรั้วกั้นบริเวณก่อสร้าง เขตอันตราย  
การจราจร ที่กองวัสดุ ออฟฟิศสนาม ห้องน้ำและห้องส้วม จุดติดตั้งเครื่องดับเพลิงชนิดเคลื่อนที่ ถังน้ำดื่ม  
ป้ายต่างๆ ที่จอดรถ เครื่องจักรกล ฯลฯ

๔.๒.๒.๔ จัดให้มีแผนการอบรม แนะนำแก่ลูกจ้างของผู้รับจ้างเกี่ยวกับเรื่องความ  
ปลอดภัยในการทำงาน การปฐมพยาบาล การระงับอัคคีภัย ก่อนเริ่มงาน และ/หรือเมื่อมีลูกจ้างใหม่ และต้อง  
แจ้งให้ผู้ควบคุมงานด้านความปลอดภัย กฟผ. ทราบ รวมถึงการปฐมนิเทศด้านความปลอดภัยในการทำงาน  
ให้ลูกจ้างใหม่ และ/หรือลูกจ้าง ที่เปลี่ยนงานใหม่

๔.๒.๒.๕ จัดให้มีขั้นตอนปฏิบัติการจัดทำรายงานการประสบอันตราย การเจ็บป่วย และ  
การตรวจสอบหาสาเหตุ รวมถึงการป้องกันเหตุเดือดร้อนรำคาญ (ถ้ามี) ตลอดจนแผนการตรวจสอบ วิเคราะห์  
และรายงานอุบัติเหตุที่เกิดขึ้น

๔.๒.๒.๖ จัดให้มีแผนงานกิจกรรมด้านความปลอดภัยอื่นๆ ตามที่กฎหมายกำหนด

๔.๒.๒.๗ จัดให้มีการกำหนดเวลาทำงานด้านความปลอดภัยในเรื่อง ดังต่อไปนี้

(๑) สถานที่ก่อสร้าง

(๑.๑) การกำหนดบริเวณเขตก่อสร้าง โดยทำรั้วสูงไม่น้อยกว่า  
๒ เมตร ที่มั่นคง แข็งแรงไว้ตลอดแนวเขตก่อสร้าง หรือกั้นเขตก่อสร้างด้วยวัสดุที่เหมาะสมตามลักษณะงาน

(๑.๒) การจัดทำป้าย “เขตก่อสร้าง” แสดงให้เห็นชัดเจน

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(๒) ภายในบริเวณก่อสร้าง

(๒.๑) การกำหนดเขตอันตรายในเขตก่อสร้าง โดยจัดทำรั้วหรือกั้นเขตด้วยวัสดุที่เหมาะสม

(๒.๒) การจัดทำป้าย “เขตก่อสร้าง” แสดงให้เห็นชัดเจน และในเวลากลางคืนให้มีสัญญาณไฟสีส้มตลอดเวลา

(๒.๓) ห้ามลูกจ้างพักอาศัยในเขตก่อสร้าง

(๓) ไฟฟ้าชั่วคราว และระบบแสงสว่าง

(๓.๑) การติดตั้งแผงไฟฟ้าชั่วคราว สายเมนไฟฟ้า

(๓.๒) การติดตั้งไฟแสงสว่าง เช่น บริเวณทางเข้า ป้ายเตือนเขต

ก่อสร้างบริเวณที่ทำงาน

(๔) ภายในอาคารที่ก่อสร้าง

(๔.๑) การติดตั้งนั่งร้าน

(๔.๒) การติดตั้งตาข่ายคลุมกันวัสดุตกหล่นปิดรอบนอกนั่งร้าน และแผงกันวัสดุตกหล่นได้นั่งร้านชั้นที่ก่อนถึงระดับพื้นดิน

(๔.๓) การติดตั้งราวกันตก

(๔.๔) การติดตั้งป้ายเตือน ป้ายบังคับ

**หมายเหตุ** ในการพิจารณาใช้งานข้อ ๔.๒.๒ หน่วยงานที่เกี่ยวข้องต้องพิจารณาถึงผลกระทบที่เกิดขึ้นจากการทำงานนั้นประกอบการพิจารณาเลือกใช้แผนงานด้านความปลอดภัย เช่น การก่อให้เกิดอันตรายถึงชีวิตต่อผู้ปฏิบัติงาน ทรัพย์สินเสียหายจากการทำงานนั้น หรือการก่อให้เกิดผลกระทบต่อธุรกิจ

**๔.๒.๓ แผนงานด้านความปลอดภัยในการทำงาน** สำหรับงานที่มีลักษณะความเสี่ยงพิเศษที่ไม่เข้าเงื่อนไขข้อ ๔.๒.๑ และ ๔.๒.๒ รวมทั้งงานที่มีผลกระทบต่อระบบการผลิตไฟฟ้าของ กฟผ. เช่น งานที่ทำงานเหนือผิวน้ำ งานที่ทำงานในอุโมงค์ หรืองานที่ทำงานใกล้หรือใต้แนวสายส่ง เป็นต้น

ผู้รับจ้างต้องเสนอแผนงานความปลอดภัยในการทำงานและมาตรการควบคุมอันตรายพิเศษในการทำงานให้ กฟผ. เห็นชอบและตรวจสอบก่อนจะเริ่มงานอย่างน้อย ๑๕ วัน

**๔.๓ ขณะการปฏิบัติงาน**

**การปฏิบัติตามหลักความปลอดภัย**

**๔.๓.๑ การจัดพื้นที่บริเวณก่อสร้างทั่วไป**

(๑) จัดทำรั้วสังกะสีสูงไม่น้อยกว่า ๒ เมตร ที่มั่นคงแข็งแรงไว้ตลอดแนวเขตก่อสร้างหรือกั้นเขตด้วยวัสดุที่เหมาะสมตามลักษณะงานและจัดทำป้าย “เขตก่อสร้าง” แสดงให้เห็นชัดเจนและในเวลากลางคืนให้มีสัญญาณไฟสีส้มตลอดเวลา พร้อมระบบสายดินล้อมรอบบริเวณพื้นที่ที่จะก่อสร้าง (ในกรณีสิ่งก่อสร้างเป็นอาคาร และ/หรืออย่างอื่นที่เจ้าหน้าที่ความปลอดภัยของ กฟผ. กำหนด) พร้อมป้ายอันตรายเขตก่อสร้างที่ขั้วทางเข้ากับที่รั้วด้านอื่นๆ อีกอย่างน้อย ๓ ด้าน รวมเป็น ๔ ด้าน และป้ายปลอดภัยไว้ก่อนป้ายสถิติอุบัติเหตุ ป้ายเขตสวมหมวกนิรภัย และป้ายห้ามสวมรองเท้าแตะที่เหนือรั้วใกล้ทางเข้า พร้อมติดไฟแสงสว่างให้มองเห็นป้ายอันตรายเขตก่อสร้างอย่างชัดเจน

(๒) จัดทำคอกกั้นพาดด้วยธงราวสีแดงสลับสีขาวสูงประมาณ ๐.๙๐-๑.๑๐ เมตร ล้อมรอบบริเวณพื้นที่ที่ก่อสร้าง สิ่งก่อสร้างที่เป็นแนวยาว เช่น รั้ว รางระบายน้ำ เป็นต้น พร้อมป้ายเขตก่อสร้างที่บริเวณทางเข้ากับที่ด้านอื่นๆ และสัญญาณไฟเตือนที่มองเห็นได้ชัดเจนอย่างน้อย ๓๐๐ เมตร ก่อนถึงจุดก่อสร้าง ในกรณีก่อสร้างใกล้ถนน พร้อมติดไฟแสงสว่างให้มองเห็นป้ายเขตก่อสร้างอย่างชัดเจน

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#### ๔.๓.๒ การจัดพื้นที่ภายในสถานที่ก่อสร้าง

(๑) ในบริเวณที่เป็นเขตอันตรายจะต้องกำหนดเขตด้วยแผงกั้น ธงราวคอกกัน พร้อมทั้งติดป้ายแจ้งเขตอันตราย และไฟสัญญาณสีส้มในเวลากลางวัน

(๒) ในบริเวณที่มีการเก็บวัตถุระเบิด วัสดุไวไฟ หรือสารเคมีที่อาจก่อให้เกิดอันตราย จะต้องมีการจัดการเก็บรักษาที่เหมาะสมและเป็นไปตามกฎกระทรวงหมวด ๓ ส่วนที่ ๒ การป้องกัน อัคคีภัย ห้ามผู้ไม่เกี่ยวข้องเข้าไปในบริเวณ และมีการควบคุมการใช้งานพร้อมป้ายเขตอันตราย ห้ามสูบบุหรี่ หรือนำเปลวไฟเข้าใกล้ระยะ ๑๕ เมตร และต้องขออนุญาตเก็บสารดังกล่าวจากผู้ควบคุมงาน และ จป.กฟผ. ก่อน แต่ทั้งนี้จะต้องจัดเก็บเท่าที่มีความจำเป็นต่อการใช้งานประจำวันเท่านั้น

(๓) ผู้รับจ้างจะต้องจัดทำป้ายจำกัดความเร็วรถที่ใช้ภายในบริเวณก่อสร้าง ไม่เกิน ๒๐ กิโลเมตรต่อชั่วโมง กรณีเป็นถนนดิน ถ้าเป็นถนนลาดยางไม่เกิน ๓๐ กิโลเมตรต่อชั่วโมง ป้ายบอก ทิศทางเดินรถ ป้ายเตือนอันตรายที่ทางเข้า-ออก และ/หรือป้ายจราจรต่างๆ ให้เป็นไปตามมาตรฐานกรม ทางหลวง และต้องติดตั้งไว้เป็นระยะตามที่เจ้าหน้าที่ความปลอดภัย กฟผ. กำหนด

(๔) ผู้รับจ้างจะต้องจัดทำป้ายเตือน ป้ายเครื่องหมายบังคับ สัญลักษณ์ความปลอดภัย เช่น เขตสวมอุปกรณ์ป้องกันอันตรายส่วนบุคคล ป้ายห้ามสูบบุหรี่ ป้ายที่หักสูบบุหรี่ ป้ายดับเพลิง ป้ายทางหนีไฟ ป้ายปฐมพยาบาล ป้ายน้ำดื่มสะอาด ป้ายห้องน้ำและห้องส้วม ป้ายที่ทำการของผู้ควบคุมงาน กฟผ. สำนักงานสนาม ป้ายโรงงาน ป้ายที่เก็บวัสดุ ป้ายสถานะของการกองเก็บวัสดุ เป็นต้น โดยให้เป็นไปตามมาตรฐานและขนาดของ กฟผ.

(๕) ผู้รับจ้างต้องจัดทำป้ายแสดงชื่อและหมายเลขโทรศัพท์ และสถานที่ติดต่อได้ สะดวกของเจ้าหน้าที่ความปลอดภัย ในบริเวณงานก่อสร้างที่สามารถเห็นได้ชัดเจน ป้ายแสดงหมายเลข โทรศัพท์หน่วยงาน เพื่อขอความช่วยเหลือกรณีฉุกเฉิน เช่น โรงพยาบาล หน่วยงานดับเพลิง หน่วยงาน บรรเทาสาธารณภัย ที่ใกล้ที่สุดไว้ ณ เขตก่อสร้างให้เห็นชัดเจน

(๖) จัดให้มีเครื่องดับเพลิงแบบเคลื่อนที่ได้ที่เหมาะสมกับชนิดของเชื้อเพลิง และต้องมีขนาดบรรจุไม่น้อยกว่า ๔ กิโลกรัม ติดตั้งในอาคารสนามอย่างน้อย ๑ เครื่อง และบริเวณปฏิบัติงาน อย่างน้อย ๑ เครื่อง ทุกจุดที่มีการเชื่อมโลหะงานสีที่มีส่วนผสมของสารตัวทำลายที่ไวไฟหรือติดไฟ งานที่ อาจก่อให้เกิดอัคคีภัย สถานที่จัดเก็บวัสดุไวไฟ วัตถุระเบิด และต้องตรวจสอบถังดับเพลิงพร้อมลงชื่อ ผู้ตรวจสอบอย่างน้อยทุกเดือน ให้อยู่ในสภาพใช้งานได้ตลอดเวลา

(๗) จัดให้มีชุดปฐมพยาบาลไม่น้อยกว่า ๑ ชุด ต่อลูกจ้าง ๑๐ คน และต้องมีอุปกรณ์ เวชภัณฑ์ในการปฐมพยาบาลครบถ้วนตามที่กฎหมายกำหนด และภาชนะบรรจุต้องสะอาดและกันน้ำได้

(๘) เตรียมพาหนะสำรอง ๑ คัน เพื่อใช้รับส่งลูกจ้างที่ได้รับอุบัติเหตุร้ายแรงไปยัง สถานพยาบาลที่ใกล้ที่สุด และในรุดดังกล่าวต้องจัดเตรียมอุปกรณ์ช่วยหายใจและออกซิเจน น้ำดื่มและ สุขาภิบาล ดังนี้

(๘.๑) น้ำดื่มสะอาดไม่น้อยกว่า ๑ ที่ ต่อลูกจ้าง ๑๕ คน

(๘.๒) ห้องน้ำและห้องส้วมที่ถูกสุขลักษณะอนามัย และแยกห้องน้ำ ชาย-หญิง ไม่น้อยกว่าอย่างละ ๑ ที่ ต่อจำนวนลูกจ้าง ๑๕ คน ตามแบบ ขนาดและลักษณะที่ กฟผ. เห็นชอบ โดยใช้ถัง บ่อเกรอะสำเร็จรูปเท่านั้น

(๙) ผู้รับจ้างต้องเก็บกองวัสดุให้เป็นระเบียบ แยกของเหลือใช้ วัสดุอันตราย ออกจากกัน พร้อมทั้งมีแนวเขต และทำความสะอาดบริเวณปฏิบัติงานหลังเลิกงานทุกวัน

(๑๐) น้ำที่เกิดจากการก่อสร้าง และมีวัสดุที่เป็นอันตรายหรือปนเปื้อนสารเคมีที่ก่อให้เกิด อันตรายหรือผลกระทบต่อสิ่งแวดล้อม ต้องมีการป้องกันและบำบัดก่อนจะระบายลงที่สาธารณะ

(๑๑) ผู้รับจ้างต้องจัดให้มีแสงสว่างฉุกเฉินในเขตก่อสร้างให้เพียงพอ เพื่อใช้ ในเวลาไฟดับ

(๑๒) ผู้รับจ้างติดป้ายเตือนอันตราย ณ ทางเข้าออกของยานพาหนะทุกแห่ง และจัดให้มีผู้ให้สัญญาณในขณะที่มียานพาหนะเข้าออกเขตก่อสร้าง

#### ๔.๓.๓ การป้องกันและระงับอัคคีภัย

(๑) ห้ามเก็บวัตถุไวไฟหรือวัตถุระเบิดไว้ในอาคารซึ่งอยู่ในระหว่างการก่อสร้าง และที่พักอาศัย เว้นแต่เก็บไว้ในที่ซึ่งปลอดภัยเท่าที่จำเป็นแก่การใช้งานประจำวันเท่านั้น

(๒) ผู้รับจ้างต้องดูแลมิให้บุคคลที่ไม่เกี่ยวข้องเข้าไปในบริเวณที่มีการเก็บวัตถุระเบิด วัสดุไวไฟ หรือสารเคมีที่อาจก่อให้เกิดอันตราย โดยต้องมีระบบการจัดเก็บรักษาที่เหมาะสม และมีการควบคุมการใช้งานพร้อมป้าย “อันตราย” “ห้ามสูบบุหรี่” “ห้ามทำให้เกิดประกายไฟ” หรือ “ห้ามพกพาอุปกรณ์สำหรับจุดไฟหรือติดไฟ” หรือป้ายซึ่งมีข้อความอื่นที่มีความหมายในทำนองเดียวกัน ตามสภาพหรือคุณสมบัติของวัตถุไวไฟหรือวัตถุระเบิดไว้ให้เห็นชัดเจน หรือห้ามนำเปลวไฟเข้าใกล้ระยะ ๑๕ เมตร และต้องขออนุญาตเก็บสารดังกล่าวจากผู้ควบคุมงาน และ จป.กพผ. ก่อน แต่ทั้งนี้ จะต้องจัดเก็บเท่าที่มีความจำเป็นต่อการใช้งานประจำวันเท่านั้น

(๓) จัดให้มีเครื่องดับเพลิงแบบเคลื่อนที่ได้ที่เหมาะสมกับชนิดของเชื้อเพลิงและต้องมีขนาดบรรจุน้ำมันอย่างน้อย ๔ กิโลกรัม ติดตั้งในอาคารสนามอย่างน้อย ๑ เครื่อง และบริเวณปฏิบัติงานอย่างน้อย ๑ เครื่อง ทุกจุดที่มีการเชื่อมโลหะงานสีที่มีส่วนผสมของสารตัวทำละลายที่ไวไฟหรือติดไฟ งานที่อาจก่อให้เกิดอัคคีภัย สถานที่จัดเก็บวัสดุไวไฟ วัตถุระเบิด และต้องตรวจสอบถังดับเพลิงพร้อมลงชื่อผู้ตรวจสอบอย่างน้อยทุกเดือน ให้อยู่ในสภาพใช้งานได้ตลอดเวลา

(๔) ผู้รับจ้างต้องจัดให้มีทางหนีไฟและบันไดหนีไฟ รวมทั้งป้ายแสดงทางหนีไฟทุกชั้นของอาคารซึ่งอยู่ระหว่างการก่อสร้าง และต้องดูแลไม่ให้มีกองวัสดุ เครื่องจักร หรือสิ่งอื่นใดกีดขวางทางหนีไฟและบันไดหนีไฟ ทั้งนี้ ทางหนีไฟต้องมีความกว้างไม่น้อยกว่า ๑.๑๐ เมตร และบันไดหนีไฟถ้าเป็นบันไดชั่วคราวจะต้องมีความมั่นคง แข็งแรง และปลอดภัยแก่ผู้ใช้

(๕) การก่อสร้างอาคารที่มีความสูงตั้งแต่ ๑๕ เมตรขึ้นไป หรือมีพื้นที่รวมกัน ทุกชั้นหรือชั้นหนึ่งชั้นใดในหลังคาเดียวกันเกิน ๒,๐๐๐ ตารางเมตร ผู้รับจ้างต้องจัดให้มีระบบสัญญาณแจ้งเหตุเพลิงไหม้ที่สามารถได้ยินทั่วถึงกันทั้งอาคาร

#### ๔.๓.๔ ไฟฟ้าชั่วคราวและระบบแสงสว่าง

(๑) ผู้รับจ้างจะต้องแนบแบบแสดงรายละเอียดลักษณะของแผนวงจรไฟฟ้าชั่วคราวที่มีวิศวกรรับรองเสนอให้ กพผ. และให้มีวิศวกรดูแลการติดตั้งและการตรวจสอบระบบไฟฟ้าให้เป็นไปตามรายละเอียดนั้นๆ พร้อมทั้งมีวิศวกรดูแลการใช้งานให้เกิดความปลอดภัย ทั้งนี้ ให้เป็นไปตามมาตรฐานของการไฟฟ้าในท้องถิ่นนั้น กรณีที่ไม่มีมาตรฐานดังกล่าวให้ปฏิบัติตามมาตรฐานของสมาคมวิศวกรรมสถานแห่งประเทศไทย ในพระบรมราชูปถัมภ์

(๒) ผู้รับจ้างต้องจัดให้มีสวิตช์ตัดวงจรไฟฟ้าเพื่อควบคุมการใช้ไฟฟ้าในเขตก่อสร้างให้เกิดความปลอดภัย ทั้งนี้ การติดตั้งให้เป็นไปตามมาตรฐานของการไฟฟ้าในท้องถิ่นนั้น กรณีที่ไม่มีมาตรฐานดังกล่าวให้ปฏิบัติตามมาตรฐานของสมาคมวิศวกรรมสถานแห่งประเทศไทย ในพระบรมราชูปถัมภ์

(๓) แผงไฟฟ้าชั่วคราวและอุปกรณ์ต้องตั้งอยู่ในบริเวณที่ปลอดภัย ห่างไกลจากสารไวไฟ น้ำฝน หรือสารเคมีอื่นๆ ซึ่งอาจจะกระเด็นหรือหกใส่ได้ หากหลีกเลี่ยงไม่ได้ต้องมีหลังคาคลุมหรือผ้าครอบที่เพียงพอ ถ้าอยู่ภายนอกอาคารต้องมีหลังคาป้องกันฝนและห้ามต่อสายไฟของอุปกรณ์ หรือเครื่องมือพ่วงรวมกันหลายๆ อุปกรณ์ในคัทเอ้าท์ หรือเครื่องตัดวงจร และแผงสวิตช์บอร์ดไฟฟ้านั้นต้องได้มาตรฐานมี Circuit Breaker กับป้ายแสดงหน้าที่การควบคุมทุกวงจรขนาดของสายไฟฟ้า และ Circuit Breaker พอเหมาะกับการใช้งานและเป็นไปตามมาตรฐาน

(๔) สายไฟฟ้าต้องเดินสูงจากพื้นดินอย่างน้อย ๒.๕๐ เมตร ชนิด ขนาดและการต่อรวมทั้งสภาพของสายไฟฟ้าต้องเหมาะสมกับการใช้งานและเป็นไปตามมาตรฐาน

(๕) หม้อแปลงไฟฟ้าแรงสูงชั่วคราวถ้าวางบนพื้นต้องมีป้ายเตือนและมีรั้วตาข่ายกันล้อมรอบ รั้วต้องห่างจากหม้อแปลง ๑ เมตรเป็นอย่างน้อย และมีระบบ Grounding ที่รั้ว และหม้อแปลง ประตูเข้าออกต้องใส่กุญแจ และต้องมีแสงสว่างในเวลากลางคืน

(๖) เต้าเสียบและเต้ารับหลายทางหรือทางเดียว ห้ามใช้กระแสไฟฟ้าเกินขนาดของสายที่ต่อแยกเข้าเต้าเสียบและเต้ารับ และตัวเต้าเสียบและเต้ารับที่ใช้ต้องมีขนาดที่สามารถทนกระแสไฟฟ้าไม่ต่ำกว่าที่กำหนดให้ใช้สำหรับสายนั้น ในสถานที่ทำงานต้องมีเต้ารับให้เพียงพอแก่การใช้งาน

(๗) จัดให้มีแสงสว่างที่ความเข้มไม่น้อยกว่ามาตรฐาน พร้อมทั้งไฟฉุกเฉินในเวลากลางคืน การปฏิบัติงานกลางคืน ต้องจัดให้มีดวงไฟส่องสว่างอย่างเพียงพอต่อการปฏิบัติงานและการสัญจรผ่านเข้าออกที่หน้างาน โดยเฉพาะอย่างยิ่งบริเวณที่อาจเกิดอันตรายและไม่ปลอดภัย เช่น หลุม อุโมงค์ ฯลฯ

(๘) ผู้รับจ้างต้องจัดให้มีระบบป้องกันกระแสไฟฟ้ารั่ว (Earth Leakage) โดยต่อสายดินสำหรับหม้อแปลง แผงไฟฟ้า อุปกรณ์ไฟฟ้าที่อยู่กับทุกชนิด ส่วนอุปกรณ์ไฟฟ้าอื่นๆ ให้ต่อสายดินกับเต้ารับที่มีจุดต่อลงดิน การติดตั้งระบบป้องกันกระแสไฟฟ้ารั่วดังกล่าวให้เป็นไปตามมาตรฐานของการไฟฟ้าในท้องถิ่นนั้น กรณีที่ไม่มีมาตรฐานดังกล่าวให้ปฏิบัติตามมาตรฐานของสมาคมวิศวกรรมสถานแห่งประเทศไทย ในพระบรมราชูปถัมภ์ และในกรณีอาคารสูงจะต้องมีระบบป้องกันฟ้าผ่าชั่วคราว

(๙) ในการทำงานติดตั้ง ตรวจสอบ ซ่อมแซม หรือซ่อมบำรุงระบบไฟฟ้าอยู่ จะต้องมีการกั้นป้องกันการสัมผัสหรือเชื่อมต่อวงจร หรือจัดให้มีระบบระมัดระวังป้องกันมิให้ผู้ใดสัมผัสหรือเชื่อมต่อวงจรตลอดเวลาที่ทำงานดังกล่าว และติดป้ายแสดงเครื่องหมายหรือสัญลักษณ์ห้ามสัมผัสหรือเชื่อมต่อวงจร และรายละเอียด วัน เวลา ผู้รับผิดชอบแขวนไว้ที่ Circuit Breaker นั้น

(๑๐) ผู้รับจ้างต้องจัดให้มีป้ายที่มีตัวอักษรหรือสัญลักษณ์ซึ่งสะท้อนแสงได้ เพื่อเตือนให้ระวังอันตรายจากไฟฟ้าที่บริเวณหม้อแปลงไฟฟ้าและแผงไฟฟ้า

#### ๔.๓.๕ การแต่งกาย

ผู้รับจ้างต้องจัดและควบคุมให้ลูกจ้างซึ่งทำงานเกี่ยวกับงานก่อสร้างสวมรองเท้าพื้นยางหุ้มส้น และอุปกรณ์คุ้มครองความปลอดภัยส่วนบุคคลที่เหมาะสมเพียงพอตามลักษณะงานที่เกี่ยวข้อง และเป็นไปตามมาตรฐานผลิตภัณฑ์อุตสาหกรรมหรือมาตรฐานอื่น และได้รับความเห็นชอบจากวิศวกร หรือผู้ควบคุมงาน โดยให้มีการตรวจสอบและอบรมการใช้อุปกรณ์นั้นก่อนการใช้งาน และทุกคนต้องสวมหมวกนิรภัยและอุปกรณ์ฯ อื่นๆ ตามที่ กฟผ. กำหนดตลอดเวลาที่ทำงาน

#### ๔.๓.๖ งานขุด งานเจาะ

(๑) การเจาะหรือขุดรู หลุม บ่อ คู และงานอื่นในลักษณะเดียวกัน ให้ผู้รับจ้าง จัดให้มีราวกันหรือรั้วกันตก แสงสว่าง และป้ายเตือนอันตราย ตามลักษณะของงานก่อสร้างเพื่อให้เกิดความปลอดภัยไว้ตลอดเวลาทำงาน และในเวลากลางคืนต้องจัดให้มีสัญญาณไฟสีส้ม หรือป้ายสีสะท้อนแสงเตือนอันตราย ให้เห็นได้ชัดเจน

(๒) การเจาะหรือขุดรู หลุม บ่อ คู และงานอื่นในลักษณะเดียวกัน ที่อาจ มีอันตรายจากการพลัดตก ผู้รับจ้างจะต้องจัดให้มีแผ่นโลหะหรือวัสดุอื่นที่มีความแข็งแรงเพียงพอปิดคลุมบนบริเวณดังกล่าวและทำราวล้อมกันด้วยไม้หรือโลหะ หรือหาวิธีการป้องกันอันตรายตามความเหมาะสม

(๓) ในบริเวณที่มีการเจาะหรือขุดรู หลุม บ่อ คู และงานอื่นในลักษณะเดียวกัน ผู้รับจ้างจะต้องมีพลอกเหล็ก แผ่นเหล็ก ค้ำยัน เสาค้ำพิค หรืออุปกรณ์อื่นเพื่อป้องกันอันตรายจากการพังทลายของดิน และมีวิศวกรตรวจสอบความมั่นคงเพื่อให้เกิดความปลอดภัย

(๔) การเจาะหรือขุดรู หลุม บ่อ คู และงานอื่นในลักษณะเดียวกัน มีความลึกตั้งแต่ ๒ เมตรขึ้นไป จะต้องมีการคำนวณ ออกแบบ กำหนดขั้นตอนการดำเนินการทั้งหมดโดยวิศวกรก่อนลงมือปฏิบัติงาน และผู้รับจ้างต้องปฏิบัติตามแบบและขั้นตอนดังกล่าว รวมทั้งต้องติดตั้งสิ่งป้องกันดินพังทลายไว้ด้วย

(๕) การเจาะหรือขุดรู หลุม บ่อ คู และงานอื่นในลักษณะเดียวกัน ในบริเวณที่มีสาธารณูปโภค ผู้รับจ้างจะต้องจัดให้มีการเคลื่อนย้ายสาธารณูปโภคเหล่านั้นตามความจำเป็น เพื่อไม่ให้เกิดอันตราย หากไม่จำเป็นต้องเคลื่อนย้ายหรือไม่สามารถเคลื่อนย้ายได้ ต้องจัดให้มีมาตรการป้องกันอันตรายเสนอขออนุมัติก่อน เพื่อป้องกันมิให้เกิดอันตรายแก่ลูกจ้างหรือบุคคลอื่น

(๖) ห้ามผู้รับจ้างให้ลูกจ้างลงไปทำงานในรูเจาะ รุขุด หลุม บ่อ คู และงานอื่นในลักษณะเดียวกัน ที่มีขนาดน้อยกว่า ๐.๗๕ เมตร และมีความลึกตั้งแต่ ๒ เมตรขึ้นไป

(๗) ห้ามผู้รับจ้างให้ลูกจ้างลงไปทำงานในรูเจาะหรือรุขุดที่ทิ้งไว้เกิน ๑๒ ชั่วโมง นับจากเริ่มการเจาะหรือขุด หรือเกิน ๓ ชั่วโมง หลังจากที่ได้เจาะหรือขุดเสร็จ เว้นแต่จะมีระบบหรืออุปกรณ์ป้องกันอันตรายที่เกิดจากดินพังทลาย

(๘) ถ้าผู้รับจ้างให้ลูกจ้างลงไปทำงานในรูเจาะ รุขุด หลุม บ่อ คู หรือพื้นที่อื่น ที่มีลักษณะเดียวกัน ซึ่งมีความลึกตั้งแต่ ๒.๐ เมตรขึ้นไป ผู้รับจ้างต้องจัดให้มี

(๘.๑) ทางขึ้นลงที่สะดวกและปลอดภัย

(๘.๒) เครื่องสูบน้ำที่มีประสิทธิภาพ

(๘.๓) ระบบการถ่ายเทอากาศและแสงสว่างที่เพียงพอและเหมาะสม

(๘.๔) ผู้ควบคุมงานที่มีประสบการณ์ด้านงานดิน และผ่านการอบรมการช่วยเหลือและการปฐมพยาบาลเบื้องต้น ประจำบริเวณปากรูเจาะ รุขุด หลุม บ่อ คู หรือพื้นที่อื่นที่มีลักษณะเดียวกัน เพื่อคอยให้ความช่วยเหลือตลอดเวลาทำงาน

(๘.๕) อุปกรณ์เพื่อการสื่อสารหรือรับส่งสัญญาณซึ่งเป็นที่เข้าใจระหว่างลูกจ้างที่ต้องลงไปทำงานในรูเจาะ รุขุด หลุม บ่อ คู หรือพื้นที่อื่นที่มีลักษณะเดียวกัน

(๘.๖) สายหรือเชือกช่วยชีวิต และเข็มขัดนิรภัยพร้อมอุปกรณ์ที่สามารถเกาะเกี่ยวได้เพื่อช่วยเหลือกรณีฉุกเฉิน

(๙) ในกรณีที่ใช้ปั้นจั่นหรือเครื่องจักรหนักปฏิบัติงาน หรืองานอื่นในลักษณะเดียวกัน ผู้ว่าจ้างต้องให้มีการป้องกันดินพังทลายโดยติดตั้งเสาเข็มพืด (Sheet Pile) หรือโดยวิธีอื่น

#### ๔.๓.๗ งานเสาเข็ม

(๑) ในการทำงานตอกเสาเข็ม ผู้รับจ้างจะต้องเสนอเอกสารตามรายละเอียด ให้ผู้ควบคุมงานรับทราบดังนี้

(๑.๑) ก่อนการดำเนินการ

๑. รายละเอียดคุณลักษณะเฉพาะของเครื่องตอกเสาเข็ม
๒. คู่มือการใช้งานของเครื่องตอกเสาเข็ม
๓. คู่มือการใช้สัญญาณสื่อสารระหว่างผู้ปฏิบัติงาน
๔. รายงานการตรวจสอบการติดตั้งที่รับรองโดยวิศวกร
๕. เอกสารการผ่านการฝึกอบรมและการผ่านงานของผู้มีหน้าที่

บังคับเครื่องตอกเสาเข็ม

(๑.๒) ก่อนการตอกเสาเข็ม

๑. รายงานการตรวจสอบการติดตั้งโดยวิศวกร
๒. รายงานการตรวจสอบอุปกรณ์ ส่วนประกอบ และป้ายต่างๆ

ก่อนการทำงานในแต่ละวัน

๓. มาตรการป้องกันคว้นไอลีเย หรือการระบายอากาศ (ถ้ามี)
๔. มาตรการป้องกันอันตรายในการทำงานใกล้สายไฟฟ้า หรือเสา

โทรคมนาคม (ถ้ามี)

๕. วิธีการเคลื่อนย้ายเสาเข็มที่นอกเหนือจากการใช้รางเลื่อน (ถ้ามี)

และในการทำงานตอกเสาเข็ม ผู้รับจ้างต้องดำเนินการตามกฎระเบียบและขั้นตอนที่กำหนด

(๒) ผู้รับจ้างต้องจัดให้ลูกจ้าง ซึ่งมีหน้าที่บังคับเครื่องตอกเสาเข็มได้รับการฝึกอบรมตามหลักเกณฑ์ วิธีการ และเงื่อนไขที่กฎหมายกำหนด

(๓) ในการประกอบ การติดตั้ง การทดสอบ การใช้ การซ่อมบำรุง และการตรวจสอบ เครื่องตอกเสาเข็ม ให้ผู้รับจ้างปฏิบัติตามรายละเอียดคุณลักษณะของเครื่องตอกเสาเข็มและคู่มือการใช้งานที่ผู้ผลิตเครื่องตอกเสาเข็มกำหนดไว้ หากไม่มีรายละเอียดคุณลักษณะหรือคู่มือการใช้งานดังกล่าว ให้ผู้ว่าจ้างปฏิบัติตามรายละเอียดคุณลักษณะหรือคู่มือการใช้งานที่วิศวกรได้กำหนดขึ้นเป็นหนังสือ

(๔) เครื่องตอกเสาเข็มที่ผู้รับจ้างจะนำมาใช้ ต้องมีรายละเอียดคุณลักษณะดังต่อไปนี้

(๔.๑) โครงเครื่องตอกเสาเข็มต้องมีค่าความปลอดภัยไม่น้อยกว่า ๒

(๔.๒) โครงเครื่องตอกเสาเข็มต้องสร้างด้วยโลหะที่มีจุดคราก (Yield Point) ไม่น้อยกว่า ๒,๔๐๐ กิโลกรัมต่อตารางเซนติเมตร

(๔.๓) โครงเครื่องตอกเสาเข็มต้องมีการโยงยึด ค้ำยัน หรือตรึงให้มั่นคง แข็งแรงและปลอดภัย

(๔.๔) คานติดตั้งรอกและฐานรองรับคานต้องสามารถรับน้ำหนักรอก ลูกตุ้ม และน้ำหนักเสาเข็มรวมกัน โดยมีค่าความปลอดภัยไม่น้อยกว่า ๕

(๔.๕) รางเลื่อนเครื่องตอกเสาเข็มต้องสามารถรับน้ำหนักได้ไม่น้อยกว่า ๒ เท่าของน้ำหนักเครื่องตอกเสาเข็ม

ในกรณีที่ใช้เครื่องตอกเสาเข็มระบบดีเซลแอมเมอร์ อุปกรณ์ที่ใช้ยึดกับโครงเครื่องตอกเสาเข็มต้องมีค่าความปลอดภัยไม่น้อยกว่า ๒

ในกรณีที่ผู้ว่าจ้างเป็นผู้จัดทำโครงสร้างเครื่องตอกเสาเข็มเองจะต้องมีวิศวกรเป็นผู้ออกแบบคำนวณโครงสร้าง และกำหนดรายละเอียดคุณลักษณะ ให้เป็นไปตามคุณลักษณะของเครื่องตอกเสาเข็มที่กำหนด

(๕) เมื่อมีการติดตั้งเครื่องตอกเสาเข็มแล้วเสร็จ ผู้รับจ้างต้องจัดให้มีวิศวกรตรวจบันทึกวันเวลาที่ตรวจ และผลการตรวจรับรองว่าถูกต้องเป็นไปตามรายละเอียดคุณลักษณะของเครื่องตอกเสาเข็มแล้วจึงใช้เครื่องตอกเสาเข็มนั้นได้

(๖) ให้ผู้รับจ้างจัดให้มีคู่มือการใช้เครื่องตอกเสาเข็มและคู่มือการใช้สัญญาณสื่อสารระหว่างผู้ปฏิบัติงานในการตอกเสาเข็ม ให้ลูกจ้างได้ศึกษาและปฏิบัติเพื่อความปลอดภัยในการทำงาน

(๗) ให้ผู้รับจ้างจัดให้มีป้ายพิกัดน้ำหนักยก และป้ายแนะนำการใช้เครื่องตอกเสาเข็มไว้ที่จุดหรือตำแหน่งที่ผู้บังคับเครื่องตอกเสาเข็มเห็นได้ชัดเจน

(๘) ก่อนเริ่มทำการตอกเสาเข็มในแต่ละวัน ให้ผู้รับจ้างจัดให้มีผู้ควบคุมงานดำเนินการตรวจสอบอุปกรณ์ รางเลื่อน แม่แรง และส่วนประกอบทั้งหมดของเครื่องตอกเสาเข็มให้อยู่ในสภาพที่ใช้งานได้อย่างปลอดภัย รวมทั้งตรวจสอบให้เครื่องตอกเสาเข็มติดตั้งอยู่บนพื้นที่ที่มั่นคงแข็งแรง พร้อมทั้งบันทึกวันเวลาที่ตรวจสอบและผลการตรวจสอบ และเก็บเอกสารการตรวจสอบดังกล่าวไว้

(๙) ในการทำงานบังคับเครื่องตอกเสาเข็ม ให้ผู้รับจ้างจัดให้มีโครงเหล็กและหลังคา ลวดตาข่ายกันของตกอยู่เหนือศีรษะของผู้บังคับเครื่องตอกเสาเข็ม โดยต้องมีขนาดช่องลวดตาข่ายแต่ละด้านไม่เกิน ๒๐ มิลลิเมตร และขนาดเส้นผ่าศูนย์กลางขนาดเส้นลวดไม่น้อยกว่า ๑.๒๕ มิลลิเมตร ทั้งนี้ ตามที่กำหนดในมาตรฐานผลิตภัณฑ์อุตสาหกรรม เว้นแต่อุปกรณ์เครื่องตอกเสาเข็มนั้นจะมีหลังคา ซึ่งมีความแข็งแรงปลอดภัย

(๑๐) การเคลื่อนย้ายเสาเข็ม ให้ผู้รับจ้างควบคุมดูแลให้เกิดความปลอดภัยแก่ลูกจ้าง หากมีการใช้รางให้วางรางเคลื่อนย้ายเสาเข็มให้ไต่ระดับและมีหมอนรองรับที่มั่นคงแข็งแรง ในกรณีที่เคลื่อนย้ายเสาเข็มโดยวิธีอื่น ให้ผู้รับจ้างจัดให้วิศวกรหรือผู้ควบคุมงานกำหนดวิธีการเคลื่อนย้ายและควบคุมดูแลให้เกิดความปลอดภัย

(๑๑) ในการยกเสาเข็มขึ้นตั้งในรางนำส่งเสาเข็ม ให้ผู้รับจ้างจัดให้มีการควบคุมให้ลูกจ้างใช้รอกหรือลวดสลิงยึดเสาเข็มในตำแหน่งที่วิศวกรได้ออกแบบกำหนดไว้

(๑๒) ให้ผู้รับจ้างจัดให้มีการควบคุมดูแลลูกจ้างซึ่งทำหน้าที่เปลี่ยนหมวกครอบหัวเข็มปฏิบัติดังต่อไปนี้

(๑๒.๑) เปลี่ยนหมวกครอบหัวเสาเข็มเมื่อลูกจ้างหยุดทำงานและอยู่ในตำแหน่งที่ปลอดภัย

(๑๒.๒) เมื่อการเปลี่ยนหมวกครอบหัวเสาเข็มได้ดำเนินการแล้วเสร็จและลูกจ้างผู้ทำหน้าที่เปลี่ยนหมวกครอบเสาเข็มพ้นออกจากบริเวณรงานำส่งแล้ว ผู้ควบคุมงานจึงจะให้สัญญาณแก่ผู้บังคับเครื่องตอกเสาเข็มเพื่อทำงานต่อไป

(๑๓) ในบริเวณที่ตอกเสาเข็มให้ผู้รับจ้างดูแลไม่ให้สิ่งกีดขวางสายตาสู่ผู้บังคับเครื่องตอกเสาเข็มที่จะมองเห็นการทำงานตอกเสาเข็ม

(๑๔) ให้ผู้รับจ้างจัดให้มีมาตรการป้องกันมิให้ควันไอเสียของเครื่องตอกเสาเข็มฟุ้งกระจายเป็นอันตรายต่อลูกจ้าง หรือจัดให้มีระบบระบายอากาศเสียออกจากบริเวณนั้น

(๑๕) ในกรณีที่มีการติดตั้งหรือเคลื่อนย้ายเครื่องตอกเสาเข็มใกล้สายไฟฟ้า ผู้รับจ้างต้องปฏิบัติให้เป็นไปตามมาตรฐานของการไฟฟ้าในท้องถิ่นนั้น กรณีที่ไม่มีมาตรฐานดังกล่าวให้ปฏิบัติตามมาตรฐานของสมาคมวิศวกรรมสถานแห่งประเทศไทย ในพระบรมราชูปถัมภ์

(๑๖) ในกรณีที่มีการติดตั้ง หรือการใช้เครื่องตอกเสาเข็ม หรือการยกเคลื่อนย้ายวัสดุที่อยู่ใกล้เสาส่งคลื่นโทรคมนาคม ก่อนให้ลูกจ้างทำงาน ผู้รับจ้างต้องจัดให้มีการตรวจการเกิดประจุไฟฟ้าเหนี่ยวนำ และถ้าปรากฏว่ามีประจุไฟฟ้าเหนี่ยวนำ ให้ผู้รับจ้างต่อสายตัวนำกับเครื่องตอกเสาเข็มหรือวัสดุนั้นเพื่อให้ประจุไฟฟ้าไหลลงดิน ทั้งนี้ ให้เป็นไปตามมาตรฐานของสมาคมวิศวกรรมสถานแห่งประเทศไทย ในพระบรมราชูปถัมภ์

(๑๗) ในการใช้เสาเข็มที่มีรูกลวงตรงกลางด้านในขนาดเส้นผ่าศูนย์กลาง ตั้งแต่ ๑๕ เซนติเมตรขึ้นไป เมื่อทำการตอกเสาเข็มเสร็จแต่ละหลุม ให้ผู้รับจ้างจัดให้มีการปิดปากรูเสาเข็ม โดยทันทีด้วยวัสดุที่มีความแข็งแรงสามารถป้องกันมิให้สิ่งของหรือผู้ใดตกลงไปในรูได้

(๑๘) ในกรณีที่เครื่องตอกเสาเข็มขัดข้อง ชำรุด หรืออยู่ในสภาพไม่ปลอดภัย ห้ามผู้รับจ้างให้ลูกจ้างใช้เครื่องตอกเสาเข็มดังกล่าว จนกว่าจะได้ซ่อมแซมแก้ไขให้อยู่ในสภาพที่ใช้งานได้อย่างปลอดภัยเสียก่อน

ในการซ่อมแซมเครื่องตอกเสาเข็มระบบไอน้ำ ระบบลม หรือระบบไฮดรอลิค ผู้รับจ้างต้องจัดให้มีการลดแรงดันของเครื่องตอกเสาเข็มให้อยู่ในระดับที่ปลอดภัยก่อน ส่วนการซ่อมแซมเครื่องตอกเสาเข็มระบบเครื่องยนต์เผาไหม้ภายในหรือระบบดีเซลแอมเมอร์ให้ดับเครื่องยนต์เสียก่อน

(๑๙) การทำงานเกี่ยวกับเครื่องตอกเสาเข็มระบบไอน้ำ ระบบลม ระบบไฮดรอลิค ระบบเครื่องยนต์เผาไหม้ภายใน ระบบดีเซลแอมเมอร์ หรือระบบอื่น ให้ผู้รับจ้างปฏิบัติตามหลักเกณฑ์ วิธีการ และเงื่อนไขที่กฎหมายกำหนด

(๒๐) งานเสาเข็มเจาะขนาดใหญ่ที่มีเส้นผ่าศูนย์กลางตั้งแต่ ๗๐ เซนติเมตรขึ้นไป ให้ผู้รับจ้างจัดให้มีวิศวกรซึ่งมีประสบการณ์ด้านปฐพีวิศวกรรมประจำสถานที่ก่อสร้างตลอดเวลาดำเนินงานของลูกจ้าง และลูกจ้างซึ่งทำงานต้องมีความชำนาญงานเสาเข็มเจาะขนาดใหญ่

(๒๑) ในกรณีที่มีการทำเสาเข็มเจาะตั้งแต่สองต้น โดยมีระบบห้ำงน้อยกว่า ๖ เท่าของเส้นผ่าศูนย์กลางของเสาเข็ม ห้ามผู้รับจ้างให้ลูกจ้างลงไปทำงานในรูเจาะเสาเข็มใดในขณะที่รูเจาะเสาเข็มข้างเคียงยังไม่ได้เทคอนกรีตหรือเทคอนกรีตแล้วแต่ยังไม่ก่อตัว

(๒๒) ในกรณีที่ผู้รับจ้างให้ลูกจ้างทำงานเสาเข็มเจาะในบริเวณที่จำกัด เช่น ใต้เพดานต่ำ ในชอกแคบหรือมุมอับ ผู้รับจ้างต้องจัดให้มีมาตรการป้องกันอันตรายเป็นกรณีพิเศษเฉพาะแห่ง เพื่อป้องกันมิให้ลูกจ้างได้รับอันตรายขณะทำงาน

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(๒๓) ห้ามผู้รับจ้างให้ลูกจ้างทำงานเกี่ยวกับงานดอกเสาเข็มและงานเสาเข็มเจาะในขณะที่มีพายุ ฝนตก พายุคะนอง หรือภัยธรรมชาติอื่น เว้นแต่ในกรณีจำเป็น เมื่อได้รับความเห็นชอบจากวิศวกรแล้ว ผู้รับจ้างจะให้ลูกจ้างทำงานที่ค้างอยู่ให้แล้วเสร็จก็ได้ แต่ต้องจัดให้มีมาตรการป้องกันอันตรายเป็นพิเศษ

(๒๔) ให้ผู้รับจ้างจัดให้มีวิศวกรควบคุมดูแลการทดสอบการรับน้ำหนักบรรทุกของเสาเข็ม โดยจัดให้มีการตรวจสอบวิธีการ ขั้นตอน และอุปกรณ์ที่ใช้ในการทดสอบตามที่วิศวกรกำหนด เช่น แม่แรง มาตรฐานวัด การยึดกับเสาเข็มสมอ แท่นรับน้ำหนักบรรทุก คันที่ใช้ทดสอบ โดยแสดงรายการคำนวณความแข็งแรงของอุปกรณ์ทดสอบทั้งหมดให้สามารถรับน้ำหนักทดสอบได้อย่างปลอดภัย

(๒๕) ให้ผู้รับจ้างจัดให้มีเครื่องหมายแสดงบริเวณที่มีการทดสอบการรับน้ำหนักบรรทุกของเสาเข็มให้เห็นชัดเจน และป้องกันไม่ให้บุคคลที่ไม่เกี่ยวข้องเข้าไปในบริเวณนั้น

(๒๖) ให้ผู้รับจ้างหยุดการทดสอบการรับน้ำหนักบรรทุกของเสาเข็มทันที หากมีเหตุที่อาจเกิดอันตราย

#### ๔.๓.๘ งานกำแพงพืด

(๑) การก่อสร้างกำแพงพืด ผู้รับจ้างต้องจัดให้มีวิศวกรที่มีความรู้ ความชำนาญ และประสบการณ์ควบคุมการทำงานให้เกิดความปลอดภัยต่อลูกจ้างตลอดเวลา และต้องเสนอมาตรการด้านความปลอดภัยในการทำงานก่อน โดยให้นำข้อความดังต่อไปนี้มาใช้บังคับกับงานก่อสร้าง กำแพงพืดโดยอนุโลม

(๑.๑) งานเสาเข็มเจาะขนาดใหญ่ที่มีเส้นผ่าศูนย์กลางตั้งแต่ ๗๐ เซนติเมตรขึ้นไป ให้ผู้รับจ้างจัดให้มีวิศวกรซึ่งมีประสบการณ์ด้านปฐพีวิศวกรรมประจำสถานที่ก่อสร้างตลอดเวลาทำงานของลูกจ้าง และลูกจ้างซึ่งทำงานต้องมีความชำนาญงานเสาเข็มเจาะขนาดใหญ่

(๑.๒) ในกรณีที่มีการทำเสาเข็มเจาะตั้งแต่สองต้น โดยมีระบบห่วงน้อยกว่า ๖ เท่าของเส้นผ่าศูนย์กลางของเสาเข็ม ห้ามผู้รับจ้างให้ลูกจ้างลงไปทำงานในรูเจาะเสาเข็มใดในขณะที่รูเจาะเสาเข็มข้างเคียงยังไม่ได้เทคอนกรีตหรือเทคอนกรีตแล้วแต่ยังไม่ก่อตัว

(๑.๓) ในกรณีที่ผู้รับจ้างให้ลูกจ้างทำงานเสาเข็มเจาะในบริเวณที่จำกัด เช่น ใต้เพดานต่ำ ในชอกแคบหรือมุมอับ ผู้รับจ้างต้องจัดให้มีมาตรการป้องกันอันตรายเป็นกรณีพิเศษเฉพาะแห่งเพื่อป้องกันมิให้ลูกจ้างได้รับอันตรายขณะทำงาน

(๒) ในระหว่างการก่อสร้างชั้นใต้ดินและมีการขุดดินออกจากบริเวณกำแพงพืด ผู้รับจ้างติดตั้งอุปกรณ์วัดค่าการเคลื่อนตัว เพื่อตรวจสอบการเคลื่อนตัวของกำแพงพืดและเตือนอันตรายที่อาจเกิดแก่ลูกจ้าง

ในกรณีที่ปรากฏการเคลื่อนตัวของกำแพงพืด มีสัญญาณเตือนอันตราย หรือมีพฤติกรรมที่อาจเกิดอันตรายแก่ลูกจ้าง ผู้รับจ้างต้องสั่งให้หยุดการทำงานและจัดให้มีการเคลื่อนย้ายลูกจ้างออกจากบริเวณนั้นทันที

#### ๔.๓.๙ งานค้ำยัน

(๑) การใช้ติดตั้ง และรื้อถอนค้ำยัน ต้องมีการคำนวณ ออกแบบ เสนอขั้นตอนการทำงาน และควบคุมงานโดยวิศวกร

(๒) การใช้ค้ำยัน ให้ผู้รับจ้างจัดให้มีการคำนวณออกแบบและควบคุมการใช้งานโดยมีวิศวกรรับรอง ดังต่อไปนี้

(๒.๑) ค้ำยันที่ทำด้วยเหล็ก ต้องสามารถรับน้ำหนักบรรทุกทุกใช้งานได้ ไม่น้อยกว่า ๒ เท่าของน้ำหนักบรรทุกทุกใช้งาน ในกรณีค้ำยันทำด้วยวัสดุอื่นที่ไม่ใช่เหล็ก ต้องสามารถรับน้ำหนักบรรทุกทุกใช้งานได้ไม่น้อยกว่า ๔ เท่าของน้ำหนักบรรทุกทุกใช้งาน และต้องมีเอกสารแสดงกำลังวัสดุประกอบด้วย

(๒.๒) ไม้ที่ใช้ทำค้ำยัน ต้องเป็นไม้ที่ไม่ผุเปื่อยหรือชำรุดจนทำให้ไม่ขาดความแข็งแรงทนทานและต้องมีหน่วยแรงดัดประลัย (Ultimate Bending Stress) ไม่น้อยกว่า ๓๐๐ กิโลกรัมต่อตารางเซนติเมตร และมีค่าความปลอดภัยไม่น้อยกว่า ๔

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(๒.๓) เหล็กที่ใช้ทำค้ำยัน ต้องเป็นเหล็กที่มีจุดคราก (Yield Point) ไม่น้อยกว่า ๒,๔๐๐ กิโลกรัมต่อตารางเซนติเมตร และค่าความปลอดภัยไม่น้อยกว่า ๒

(๒.๔) ข้อต่อและจุดยึดต่างๆ ของค้ำยันต้องมั่นคงแข็งแรง

(๒.๕) ในกรณีที่มีที่รองรับค้ำยัน ต้องสามารถรับน้ำหนักบรรทุกทุกได้ไม่น้อยกว่า ๒ เท่าของน้ำหนักบรรทุกใช้งาน

(๒.๖) ค้ำยันต้องยึดโยงหรือตรึงกับพื้น

(๓) ในกรณีที่มีการเทคอนกรีตเหนือค้ำยัน ให้ผู้รับจ้างควบคุมการเทคอนกรีตให้เป็นไปตามมาตรฐานของสมาคมวิศวกรรมสถานแห่งประเทศไทย ในพระบรมราชูปถัมภ์ และควบคุมดูแลมิให้บุคคลที่ไม่เกี่ยวข้องเข้าไปอยู่ใต้บริเวณที่เทคอนกรีตนั้น

(๔) ให้ผู้รับจ้าง ประกอบ ติดตั้ง และตรวจสอบค้ำยันให้มั่นคงแข็งแรงและมีความปลอดภัย

#### ๔.๓.๑๐ งานเครื่องจักร

(๑) ในกรณีที่มีการติดตั้งหรือทดสอบการใช้งานของเครื่องจักรและอุปกรณ์ ในหรือนอกอาคารซึ่งอยู่ในระหว่างการก่อสร้างอันอาจก่อให้เกิดอันตราย เช่น การติดตั้งหรือทดสอบการทำงานของระบบไฟฟ้าหรือเครื่องจักร ผู้รับจ้างต้องจัดให้มีวิศวกรวางแผนงานและควบคุมตลอดเวลาที่ทำการติดตั้งหรือทดสอบ ในกรณีที่มีการติดตั้งหรือทดสอบยังไม่เสร็จ ต้องปิดกั้นพื้นที่หรือห้องที่มีเครื่องจักรและอุปกรณ์ ซึ่งอยู่ในระหว่างการติดตั้งหรือการทดสอบให้มีติดชิดและปลอดภัย ก่อนจะทำการติดตั้งหรือทดสอบคราวต่อไป

(๒) ในการทำงานเกี่ยวกับเครื่องจักรที่อาจเกิดอันตราย ผู้รับจ้างต้องใช้ลูกจ้างซึ่งมีความชำนาญการใช้เครื่องจักรนั้น และผ่านการอบรมตามหลักเกณฑ์ วิธีการและเงื่อนไขที่กฎหมายกำหนด

(๓) ให้ผู้รับจ้างจัดให้มีเครื่องป้องกันอันตรายสำหรับลูกจ้างซึ่งทำงานกับเครื่องจักร เช่น หลังคาแกว่ ที่ปิดครอบแท่นหมุน เครื่องปิดบังประกายไฟ หรือตะแกรงเหล็กเหนียว

(๔) ให้ผู้รับจ้างควบคุมดูแลมิให้ผู้ที่ไม่เกี่ยวข้องเข้าไปในห้องควบคุมหรือในรัศมีการทำงานของเครื่องจักร และควบคุมดูแลมิให้ผู้ใดหย่อน เคาะ ยื่น หรือโดยสารไปกับเครื่องจักร ซึ่งเคลื่อนที่ได้ และมีได้จัดไว้เพื่อการนั้น

ในกรณีที่มีลูกจ้างทำงานในรัศมีการทำงานของเครื่องจักร ผู้รับจ้างต้องดูแลและมัดระวังมิให้ลูกจ้างได้รับอันตรายจากเครื่องจักรหรือวัสดุสิ่งของที่ตกจากเครื่องจักรนั้น

(๕) ให้ผู้รับจ้างดูแลเครื่องจักรและอุปกรณ์ที่ใช้ในการทำงานก่อสร้างให้อยู่ในสภาพที่ใช้งานได้ดีและปลอดภัย ตามระยะเวลาการทำงานที่เหมาะสม และการตรวจรับรองประจำปี ตามชนิดและประเภทที่กฎหมายกำหนด

ในกรณีเครื่องจักรหรืออุปกรณ์ที่ใช้ในการทำงานก่อสร้างชำรุดบกพร่อง อันอาจเป็นเหตุให้เกิดอันตราย ให้ผู้รับจ้างจัดให้มีการซ่อมแซมทันที และมีให้ลูกจ้างใช้งานเครื่องจักรหรืออุปกรณ์นั้นจนกว่าจะซ่อมแซมเสร็จและใช้งานได้โดยปลอดภัย

(๖) ในกรณีอาจเกิดอันตรายจากการเคลื่อนที่ของเครื่องจักรใด ให้ผู้รับจ้างติดตั้งอุปกรณ์เตือนอันตรายที่เครื่องจักรนั้น เช่น สัญญาณเสียงและแสงสำหรับการเดินหน้าหรือถอยหลังของเครื่องจักร และติดป้ายเตือนอันตรายให้เห็นได้ชัดเจน

#### ๔.๓.๑๑ งานปั้นจั่น

(๑) ในการทำงานเกี่ยวกับปั้นจั่น ผู้รับจ้างต้องให้ลูกจ้างซึ่งเป็นผู้บังคับ ผู้ให้สัญญาณ ผู้ยึดเกาะวัสดุ ผู้ควบคุม ผ่านการอบรมหลักสูตรการปฏิบัติงานดังกล่าวและต้องจัดให้มีการอบรมหรือทบทวนการทำงานเกี่ยวกับปั้นจั่น

(๒) ก่อนการทำงานผู้รับจ้างจะต้องเสนอเอกสารตามรายละเอียดให้ผู้ควบคุมงานเพื่อทราบ

(๒.๑) รายละเอียดคุณลักษณะของปั้นจั่น

(๒.๒) รายการคำนวณฐานราก และแบบก่อสร้างโดยวิศวกร



- (๒.๓) ระบบการป้องกันฟ้าผ่า และระบบสายดินของบับนั้
- (๒.๔) คู่มือการใช้งานของบับนั้
- (๒.๕) ขั้นตอนการทำงาน
- (๒.๖) คู่มือการใช้สัญญาณสื่อสารระหว่างผู้ปฏิบัติงาน หากมีการใช้สัญญาณ  
มื่อต้องมีภาพสัญญาณมื่อมาตรฐานติดไว้ที่บอร์ดสนาม และมีการลงนามรับทราบของผู้เกี่ยวข้อง
- (๒.๗) บันทึกการตรวจสอบการติดตั้งโดยวิศวกร
- (๒.๘) รายงานการทดสอบ ตรวจสอบส่วนประกอบและอุปกรณ์ตามที่กฎหมาย  
กำหนด

- (๓) ในระหว่างการทำงานจะต้อง
  - (๓.๑) มีการป้องกันอันตรายจากลวดสลิง ส่วนที่เคลื่อนไหว การลื่น การตก  
เชื้อเพลิง ควัน ไอเสีย
  - (๓.๒) มีสัญญาณเสียง และแสงไฟเตือนภัยตลอดเวลาที่ทำงาน
  - (๓.๓) มีป้ายแสดงพิกัดน้ำหนักที่ยกได้ที่ตัวรถบับนั้ หรือป้ายพิกัดน้ำหนักที่  
ยกได้ทุกระยะที่แสดงของบับนั้แบบ Tower
  - (๓.๔) การตรวจสอบการใช้งานประจำวัน
  - (๓.๕) จัดให้มีเครื่องดับเพลิงที่เหมาะสมกับชนิดของบับนั้ และใช้การได้  
ที่ห้องบังคับบับนั้

(๔) เมื่อมีการใช้บับนั้ใกล้สายไฟ จะต้องมีกรขออนุญาตเข้าทำงาน มีการกันเขต  
อันตรายให้เห็นชัดเจนและให้ปฏิบัติ ดังนี้

(๔.๑) ถ้าสายไฟฟ้ามีแรงดันไฟฟ้าไม่เกิน ๕๐ กิโลโวลต์ ให้ระยะห่าง ระหว่าง  
สายไฟฟ้านั้นกับส่วนหนึ่งส่วนใดของบับนั้ หรือกับส่วนหนึ่งส่วนใดของวัสดุบับนั้กำลังยกอยู่ต้อง ไม่น้อยกว่า  
๓ เมตร

(๔.๒) ถ้าสายไฟฟ้ามีแรงดันไฟฟ้าเพิ่มเกิน ๕๐ กิโลโวลต์ ให้ระยะห่างระหว่าง  
สายไฟฟ้านั้นกับส่วนหนึ่งส่วนใดของบับนั้ หรือกับส่วนหนึ่งส่วนใดของวัสดุบับนั้กำลังยกอยู่เพิ่มขึ้นจาก  
ระยะห่างตาม (๔.๑) อีก ๑ เซนติเมตร สำหรับแรงดันไฟฟ้าที่เพิ่มขึ้น ๑ กิโลโวลต์

(๔.๓) ในกรณีที่บับนั้เคลื่อนที่ โดยไม่ยกวัสดุและไม่ลดแขนบับนั้ให้  
ระยะห่างส่วนหนึ่งส่วนใดของบับนั้กับสายไฟฟ้า เป็นดังนี้

(๔.๓.๑) สำหรับสายไฟฟ้ามีแรงดันไฟฟ้าเกิน ๕๐ กิโลโวลต์ แต่  
ไม่เกิน ๓๒๕ กิโลโวลต์ ไม่น้อยกว่า ๓ เมตร

(๔.๓.๒) สำหรับสายไฟฟ้ามีแรงดันไฟฟ้าเกิน ๓๒๕ กิโลโวลต์ แต่  
ไม่เกิน ๗๕๐ กิโลโวลต์ ไม่น้อยกว่า ๕ เมตร

(๔.๔) ถ้าบับนั้หรือวัสดุที่จะยกตั้งอยู่ใกล้เสาส่งคลื่นโทรคมนาคม ก่อนใช้  
บับนั้นั้น ให้ผู้รับจ้างจัดให้มีการตรวจตัวบับนั้และวัสดุนั้นว่าเกิดประจุไฟฟ้าเหนี่ยวนำหรือไม่ ถ้าพบว่ามีประจุ  
ไฟฟ้าเหนี่ยวนำที่ตัวบับนั้และวัสดุที่จะยก ให้ผู้รับจ้างต่อสายตัวนำกับบับนั้และวัสดุนั้น ให้ประจุไฟฟ้าไหล  
ลงดินตลอดเวลาที่มีการใช้บับนั้ทำงานใกล้เสาส่งคลื่นโทรคมนาคม

(๔.๕) ถ้ามีสารไวไฟอยู่ในบริเวณที่ใช้บับนั้ ให้ผู้รับจ้างนำสารไวไฟออกจาก  
บริเวณที่ใช้บับนั้ก่อนปฏิบัติงาน

(๔.๖) ห้ามมิให้ผู้รับจ้างให้ลูกจ้างทำงานเกี่ยวกับบับนั้ที่ชำรุดเสียหาย หรืออยู่  
ในสภาพที่ไม่ปลอดภัย

(๔.๗) ถ้ามีการทำงานเกี่ยวกับบับนั้ในเวลากลางคืน ให้ผู้รับจ้างจัดให้มีแสง  
สว่างทั่วบริเวณตลอดเวลาที่พนักงานทำงาน

#### ๔.๓.๑๒ งานลิฟต์ขนส่งวัสดุชั่วคราวและลิฟต์โดยสารชั่วคราว

- (๑) ก่อนการทำงานผู้รับจ้างจะต้องเสนอเอกสารตามรายละเอียดให้ผู้ควบคุมงานเพื่อทราบ
  - (๑.๑) รายละเอียดของตัวลิฟต์ หอลิฟต์ตามมาตรฐาน
  - (๑.๒) ข้อกำหนดในการก่อสร้างตามมาตรฐาน
  - (๑.๓) ข้อปฏิบัติในการใช้งานตามมาตรฐาน
  - (๑.๔) รายละเอียดคุณลักษณะของลิฟต์
  - (๑.๕) คู่มือการใช้งานของลิฟต์
  - (๑.๖) เอกสารแสดงผลการอบรม และผลการตรวจสอบของผู้บังคับลิฟต์เอกสารการแต่งตั้งผู้บังคับลิฟต์ รายงานการตรวจสอบลิฟต์ก่อนการใช้งานประจำวัน รายงานการตรวจสอบส่วนประกอบและอุปกรณ์โดยวิศวกรทุกเดือน
- (๒) ลิฟต์ขนส่งวัสดุชั่วคราว ลิฟต์โดยสารชั่วคราว และลิฟต์ที่ใช้ทั้งขนส่งวัสดุและโดยสารชั่วคราว ต้องมีรายละเอียดของหอลิฟต์ ตัวลิฟต์ ข้อกำหนดในการก่อสร้าง และข้อปฏิบัติในการใช้ตามหลักเกณฑ์ วิธีการที่กฎหมายกำหนด
- (๓) ในการประกอบ การติดตั้ง การทดสอบ การใช้ การซ่อมบำรุงและการตรวจสอบลิฟต์ให้ผู้รับจ้างปฏิบัติตามรายละเอียดคุณลักษณะของลิฟต์แต่ละประเภท และคู่มือการใช้งานที่ผู้ผลิตลิฟต์กำหนดไว้ หากไม่มีรายละเอียดคุณลักษณะหรือคู่มือการใช้งานดังกล่าว ให้ผู้รับจ้างปฏิบัติตามรายละเอียดคุณลักษณะหรือคู่มือการใช้งานที่วิศวกรได้กำหนดขึ้นเป็นหนังสือ
- (๔) ผู้รับจ้างจะต้องติดป้ายบอกน้ำหนักบรรทุกสูงสุด และป้ายห้ามโดยสารสำหรับลิฟต์ขนส่งวัสดุชั่วคราว และป้ายบอกน้ำหนักบรรทุก และจำนวนผู้โดยสารสูงสุด สำหรับลิฟต์โดยสารชั่วคราวไว้ภายนอกและภายในให้ชัดเจน พร้อมทั้งติดข้อกำหนดการใช้ลิฟต์ในบริเวณที่มีการใช้งานตลอดเวลา
- (๕) ให้ผู้รับจ้างจัดให้มีการตรวจสอบส่วนประกอบและอุปกรณ์ของลิฟต์ทุกเดือนตามหลักเกณฑ์และวิธีการที่กฎหมายกำหนด โดยวิศวกรเป็นผู้ควบคุมและบันทึกวันเวลาที่ตรวจสอบ และเก็บผลการตรวจสอบไว้เป็นหลักฐาน
- (๖) ให้ผู้รับจ้างควบคุมดูแลมิให้บุคคลใดโดยสารลิฟต์ขนส่งวัสดุชั่วคราว และให้ติดป้ายห้ามโดยสารให้เห็นชัดเจน เว้นแต่เป็นการติดตั้ง ตรวจสอบ บำรุงรักษา และรื้อถอนโดยผู้เกี่ยวข้องเท่านั้น
- (๗) การใช้ลิฟต์ ผู้รับจ้างต้องปฏิบัติ ดังต่อไปนี้
  - (๗.๑) จัดทำข้อกำหนดในการใช้ลิฟต์ติดไว้บริเวณที่มีการใช้ลิฟต์ให้เห็นได้ชัดเจน และควบคุมดูแลให้มีการปฏิบัติตามข้อกำหนดดังกล่าวโดยเคร่งครัด
  - (๗.๒) จัดให้มีลูกจ้างซึ่งมีอายุไม่ต่ำกว่า ๑๘ ปี และได้รับการฝึกอบรมการใช้ลิฟต์มาแล้วทำหน้าที่บังคับลิฟต์ประจำตลอดเวลาที่ใช้ลิฟต์
  - (๗.๓) บริเวณที่ผู้บังคับลิฟต์ทำงานจะต้องจัดให้มีหลังคาที่มั่นคงแข็งแรงเพียงพอป้องกันมิให้เกิดอันตรายจากการตกหล่นของวัสดุสิ่งของ
  - (๗.๔) ให้มีการตรวจสอบลิฟต์ก่อนการใช้งานทุกวัน หากส่วนใดชำรุดเสียหายต้องซ่อมแซมให้เรียบร้อยก่อนใช้งาน
  - (๗.๕) ในกรณีลิฟต์ไม่อยู่ในสภาพพร้อมใช้งาน หรือไม่มีผู้ทำหน้าที่บังคับลิฟต์ต้องปิดสวิทช์พร้อมทั้งใส่กุญแจและติดป้าย “ห้ามใช้ลิฟต์” ให้ลูกจ้างทราบ
  - (๗.๖) จัดวางและป้องกันมิให้วัสดุตกหรือยื่นออกมาขัดกับโครงหอลิฟต์
  - (๗.๗) ในการใช้ลิฟต์ขนรถหรือเครื่องมือที่มีล้อ ต้องป้องกันมิให้รถหรือเครื่องมือนั้นเคลื่อนที่ได้

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#### ๔.๓.๑๓ งานเชือก ลวดสลิง รอก

(๑) ผู้รับจ้างจะต้องควบคุมให้มีการใช้เชือก ลวดสลิงที่มีขนาดเหมาะสมกับรอก มีการตรวจสอบสภาพก่อนการใช้งานก่อนการปฏิบัติงานประจำวัน และบันทึกการตรวจสอบประจำเดือน

(๒) เชือก หรือลวดสลิงที่ใช้ต้องมีสภาพดี แข็งแรงทนทาน และมีการใช้ลูกกลิ้งหรือวัสดุอื่นเพื่อป้องกันการครูดของเชือก ลวดสลิง

(๓) การใช้เชือก ลวดสลิงและรอก ต้องเป็นไปตามหลักเกณฑ์และวิธีการที่กฎหมายกำหนด

(๔) ลวดสลิงที่ใช้ในการลาก ชักลากและยกวัสดุต่างๆ ผู้รับจ้างจะต้องตรวจสอบอยู่เสมอ หากพบว่ามีความเสียหายเกินกว่า ๑๐% ของจำนวนเส้นลวด หรือเส้นผ่าศูนย์กลางลดลงเกิน ๕% ผู้รับจ้างจะต้องเปลี่ยนใหม่ทันที

(๕) ผู้บังคับ ผู้ให้สัญญาณ ผู้ยึดเกาะวัสดุ ผู้ควบคุม ต้องผ่านการอบรมหลักการปฏิบัติงานดังกล่าว

(๖) อุปกรณ์และเครื่องกว้าน ต้องติดตั้งให้มั่นคงกับพื้นที่ที่มีความแข็งแรง และอยู่ในวิสัยที่ดี

(๗) พื้นที่ทำงานจะต้องมีป้ายเตือน และกันเขตป้องกันผู้ที่ไม่มีส่วนเกี่ยวข้องเข้ามาในบริเวณ

(๘) เส้นผ่าศูนย์กลางของเครื่องกว้านต้องมีขนาด ๒๐ เท่าของเส้นผ่าศูนย์กลางของเชือกหรือสลิง ปลายสลิงที่อยู่ใน Drum จะต้องถูกตรึงให้แน่นหนา และมีเครื่องหมายเตือนมิให้ใช้จนหมด

(๙) ระบบเบรกที่ใช้ให้เหยียบต้องไม่มีสิ่งกีดขวาง ระบบส่งกำลังต้องมีครอบนิรภัยมอเตอร์ไฟฟ้าต้องต่อสายดินอย่างถูกต้อง

#### ๔.๓.๑๔ การป้องกันอันตรายการตกจากที่สูง

(๑) การทำงานในที่สูงจากพื้นดินหรือพื้นอาคารตั้งแต่ ๒ เมตรขึ้นไป ต้องมีบันไดนั่งร้าน ขาหยั่ง หรือม้ายืนที่ปลอดภัยตามมาตรฐาน และมีการทำงานบนที่ลาดชันที่ทำมุมเกิน ๓๐ องศา ต้องจัดให้มีนั่งร้าน สายหรือเชือกช่วยชีวิต และเข็มขัดนิรภัยพร้อมอุปกรณ์

(๒) ในกรณีที่ทำงานในสถานที่อาจได้รับอันตรายจากการพลัดตก หรือถูกวัสดุทับต้องจัดทำราวกันหรือรั้วกันตก ตาข่าย สิ่งปิดกั้น และจัดให้มีการใช้สายหรือเชือกช่วยชีวิตและเข็มขัดนิรภัยพร้อมอุปกรณ์

(๓) ในกรณีที่ทำงานในชั้นของอาคารหรือสิ่งก่อสร้างที่เปิดโล่งและอาจพลัดตกลงมาได้ ต้องจัดทำราวกันหรือรั้วกันตกตามมาตรฐานของสมาคมวิศวกรรมสถานแห่งประเทศไทย ในพระบรมราชูปถัมภ์

#### ๔.๓.๑๕ งานนั่งร้าน บันได ขาหยั่ง ม้ายืน

(๑) การสร้าง ประกอบ ติดตั้ง และตรวจสอบต้องเป็นไปตามเกณฑ์มาตรฐาน หรือมีการรับรองโดยวิศวกร

(๒) อุปกรณ์ที่ใช้งานต้องอยู่ในสภาพดี มีการตรวจสอบทั้งหลังการติดตั้ง และก่อนการใช้งานหรือทุก ๗ วัน หรือเมื่อมีการเปลี่ยนแปลงการใช้งาน ทั้งนี้ รายงานการตรวจสอบจะต้องได้รับการรับรองจากผู้รับผิดชอบ

(๓) บันไดได้ต้องมีความปลอดภัยตามมาตรฐาน วสท.

(๔) ขาหยั่ง ม้ายืน ต้องมีโครงสร้างที่แข็งแรง มีพื้นที่ยืนที่เหมาะสม

(๕) พื้นนั่งร้านต้องไม่สั่น มีความมั่นคง มีความกว้างไม่น้อยกว่า ๐.๓๕ เมตร บนชั้นที่ทำงานมีราวกันตก และไม่มีส่วนใดชำรุด

(๖) มีสิ่งป้องกันมิให้เกิดอันตรายต่อผู้ทำงานอยู่ชั้นล่าง

#### ๔.๓.๑๖ การป้องกันอันตรายจากการพังทลาย หรือการกระเด็นของวัสดุ

(๑) ในกรณีที่ลูกจ้างทำงานในบริเวณที่อาจมีการพังทลาย หรือการกระเด็น หรือตกหล่นของหิน ดิน หวาย หรือวัสดุต่างๆ ผู้รับจ้างต้องจัดทำไหล่หิน ดิน หวาย หรือวัสดุนั้นให้ลาดเอียงเป็นมุม หรือวิธีการอื่นที่ป้องกันการพังทลาย

(๒) กรณีที่ให้ลูกจ้างทำงานในท่อ บ่อ ช่อง โพรง อุโมงค์ หรือบ่อที่อาจมีการพังทลาย ผู้รับจ้างต้องจัดทำผนังกัน ค้ำยัน หรือใช้วิธีการอื่นใดที่สามารถป้องกันอันตรายนั้นได้

(๓) ผู้รับจ้างต้องป้องกันการกระเด็นหรือตกหล่นของวัสดุโดยใช้ผ้าใบ ดาข่าย หรือวัสดุอื่นใดที่มีลักษณะเดียวกันปิดกันหรือรองรับ

(๔) การลำเลียงวัสดุขึ้น-ลงที่สูง ให้จัดทำราง ปล่อย หรือใช้เครื่องมือและวิธีการลำเลียงที่เหมาะสมและปลอดภัย และจัดทำโครงสร้างให้มีความมั่นคงแข็งแรง

#### ๔.๓.๑๗ งานอุโมงค์

(๑) ให้ผู้รับจ้างจัดให้มีการอบรมวิธีทำงานในอุโมงค์ และวิธีป้องกันอันตรายแก่ลูกจ้างก่อนเข้าทำงานในอุโมงค์ และต้องอบรมทบทวนหรือเพิ่มเติมเป็นประจำไม่น้อยกว่าเดือนละหนึ่งครั้ง

(๒) ในการขุดเจาะอุโมงค์ ให้ผู้รับจ้างจัดหาวิศวกรซึ่งมีประสบการณ์ด้านอุโมงค์และด้านปฐพีวิศวกรรมเป็นผู้ออกแบบ กำหนดวิธีปฏิบัติงาน และต้องมีวิศวกรซึ่งมีประสบการณ์ด้านงานขุดเจาะอุโมงค์เป็นผู้ควบคุมงานตลอดเวลา

(๓) การก่อสร้างและการทำงานในอุโมงค์ ให้ปฏิบัติตามหลักเกณฑ์และวิธีการเพื่อความปลอดภัยที่กฎหมายกำหนด

(๔) กรณีมีการปฏิบัติงานในที่อับอากาศ ต้องจัดให้มีการอบรมความปลอดภัยในการทำงานในที่อับอากาศให้กับผู้มีหน้าที่ในการอนุญาต ผู้ควบคุมงาน ผู้ช่วยเหลือและผู้ปฏิบัติงานในที่อับอากาศ

#### ๔.๓.๑๘ งานก่อสร้างในน้ำ

(๑) ก่อนทำงานก่อสร้างในน้ำ ให้ดำเนินการดังนี้

(๑.๑) จัดทำแผนการปฏิบัติงานและป้องกันอันตรายที่อาจเกิดขึ้นจากการทำงาน และติดประกาศหรือแจ้งให้ทราบเป็นลายลักษณ์อักษร

(๑.๒) จัดทำแผนฉุกเฉินกรณีเกิดภัยธรรมชาติ และจัดให้มีการอบรมและฝึกซ้อมตามแผนฉุกเฉินนั้น

(๑.๓) จัดให้มีอุปกรณ์ช่วยชีวิตตามข้อกำหนดของกรมการขนส่งทางน้ำ และพาณิชย์นาวี หรือหน่วยงานอื่น เช่น ชูชีพ เข็มขัดนิรภัย สายชูชีพ และอุปกรณ์คุ้มครองความปลอดภัยส่วนบุคคลอื่นๆ

(๑.๔) จัดให้มีการตรวจสอบการขึ้น-ลง ของระดับน้ำอย่างสม่ำเสมอ เว้นแต่สภาพของพื้นที่ไม่มีการขึ้นลงของระดับน้ำ

(๒) การใช้อุปกรณ์ไฟฟ้าในงานก่อสร้างในน้ำ ให้จัดหาและดูแลให้อุปกรณ์ไฟฟ้าเป็นชนิดที่สามารถป้องกันน้ำ ความชื้น หรือไอระเหยของสารที่มีความไวไฟ ซึ่งอาจทำให้เกิดไฟฟ้าลัดวงจร การลุกไหม้ หรือการระเบิดได้

(๓) ในการทำงานบนแคร่ลอยหรือนั่งร้านเหนือพื้นน้ำ ให้จัดให้มี

(๓.๑) การยึดโยงหรือติดตั้งโครงสร้างรองรับและโครงเครื่องจักร รวมทั้งอุปกรณ์ที่ติดตั้งบนแคร่ลอยหรือนั่งร้านให้มั่นคงปลอดภัย

(๓.๒) สะพานทางเดินและบันไดเชื่อมต่อระหว่างแคร่ลอยกับฝั่งหรือแคร่ลอยที่อยู่ใกล้เคียงให้มั่นคงปลอดภัย

(๓.๓) ดูแลให้เกิดความปลอดภัยและรักษาความสะอาดพื้นแคร่ลอย หรือ  
นั่งร้านตลอดเวลาทำงาน

(๓.๔) สวมใส่ชูชีพตลอดเวลาทำงาน และถ้ามีการทำงานในเวลากลางคืน  
ชูชีพต้องติดพราวน้ำหรือวัสดุเรืองแสงด้วย

#### ๔.๓.๑๙ งานเชื่อม

(๑) ก่อนการทำงานเชื่อมไฟฟ้าหรือแก๊ส ผู้รับจ้างจะต้องจัดเตรียมเครื่องดับเพลิง  
อุปกรณ์ป้องกันอันตรายส่วนบุคคล และอุปกรณ์ความปลอดภัยอื่นๆ ที่เหมาะสม พร้อมทั้งตรวจสอบบริเวณ  
โดยรอบมิให้มีวัสดุไวไฟ มีการกันเขต และอุปกรณ์ป้องกันอันตรายจากประกายไฟ แสงจ้า และอันตรายจาก  
วัสดุพังทาบ

(๒) ผู้รับจ้างจะต้องตรวจสอบอุปกรณ์ใช้งานให้เป็นไปตามมาตรฐาน ทั้งการติดตั้งสายดิน  
หัวเชื่อม อุปกรณ์ควบคุมแรงดัน อุปกรณ์ป้องกันเปลวไฟย้อนกลับ (ถ้ามี) ตรวจสอบการรั่วไหล ข้อต่อ รวมถึง  
การระบายอากาศ

(๓) ผู้รับจ้างจะต้องมีการใช้สัญลักษณ์และสี ที่ทาส่งแก๊ส หัวเชื่อม หัวตัดให้เป็นแบบ  
และชนิดเดียวกัน

(๔) ในกรณีมีการทำงานในพื้นที่ที่อาจมีอันตราย และความเสี่ยงต่อวัสดุ อุปกรณ์  
ข้างเคียงต้องมีการขออนุญาตก่อนเข้าทำงาน

(๕) ถังแก๊สและถังลม ต้องอยู่ในสภาพตั้งและผูกตรึงให้มั่นคงมีให้ล้ม มีการตรวจสอบสภาพ  
สายยางและต้องมีฝาคอรวาล์ว

#### ๔.๓.๒๐ งานรดยก

(๑) ผู้รับจ้างจะต้องใช้พนักงานขับรถยกที่ผ่านการอบรม มีประสบการณ์ และมี  
ใบรับรองการผ่านงานและการตรวจสอบสุขภาพ ผู้ให้สัญญาจะต้องผ่านการอบรม

(๒) ก่อนการทำงานผู้รับจ้างจะต้องจัดเตรียมคู่มือการใช้งาน คู่มือการตรวจสอบ และการ  
บำรุงรักษา ผลการตรวจสอบการใช้งานตามระยะเวลาที่กฎหมายกำหนดไว้ให้ตรวจสอบก่อนการใช้งาน

(๓) ผู้รับจ้างต้องจัดให้มีโครงหลังคาที่มั่นคงแข็งแรง สามารถป้องกันอันตรายจาก  
วัสดุตกหล่นได้

(๔) ผู้รับจ้างจะต้องจัดเตรียมรดยก พร้อมอุปกรณ์ความปลอดภัยที่เหมาะสม มี  
สัญญาณเสียง แสงไฟเตือนภัยในขณะที่ทำงาน พร้อมทั้งป้ายแสดงพิกัดน้ำหนักยกที่รดยก

(๕) ผู้รับจ้างจะต้องจัดเตรียมป้ายเตือน กันเขตอันตราย ตรวจสอบสภาพความ  
แข็งแรงของพื้นบริเวณรดยก และตรวจสอบสภาพทั่วไปของรดยกทุกเดือน

(๖) ตรวจสอบรดยกให้มีสภาพใช้งานได้อย่างปลอดภัยก่อนการใช้งานทุกครั้ง และเก็บ  
ผลการตรวจสอบไว้ให้พนักงานตรวจแรงงานตรวจสอบได้

(๗) ห้ามทำการดัดแปลงหรือกระทำการใดที่มีผลทำให้ความปลอดภัยในการทำงาน  
ของรดยกลดลง

(๘) ในการใช้งานรดยกใกล้สายไฟฟ้า ระยะห่างระหว่างสายไฟและรดยกต้องเป็นไป  
ตามมาตรฐานของการไฟฟ้าท้องถิ่น หรือมาตรฐาน วสท. และต้องขออนุญาตเข้าทำงานทุกครั้งหากทำงาน  
ใกล้สายไฟฟ้าแรงสูง

(๙) ห้ามบุคคลโดยสารไปกับรดยก

#### ๔.๓.๒๑ การใช้เครื่องจักรและยานพาหนะ

(๑) เครื่องจักร ยานพาหนะ และเครื่องมือที่ใช้ในการปฏิบัติงาน ต้องอยู่ในสภาพที่  
ไม่ชำรุดบกพร่อง และมีฝาคอป้องกันอันตราย

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(๒) การขั้วสายพาหนะและเครื่องจักรภายในบริเวณพื้นที่ก่อสร้าง ต้องใช้ความระมัดระวัง และใช้อัตราความเร็วดังนี้

(๒.๑) ไม่เกิน ๓๐ กิโลเมตรต่อชั่วโมง สำหรับถนนคอนกรีตและราดยาง

(๒.๒) ไม่เกิน ๒๐ กิโลเมตรต่อชั่วโมง สำหรับถนนดินทั่วไป

(๓) การเคลื่อนย้ายรถเครน ลอดผ่านหรือใกล้บริเวณที่มีสาย Over Head Line สายไฟฟ้าแรงสูง สายโทรศัพท์ และการใช้เครนปฏิบัติงานในบริเวณใกล้กับสายไฟฟ้าแรงสูง ต้องแจ้งให้ กฟผ. ทราบล่วงหน้า เพื่อกำหนดกฎเกณฑ์ด้านความปลอดภัยก่อนปฏิบัติงานทุกครั้ง

(๔) รถบรรทุกหรือรถ Dump ที่ลำเลียงวัสดุจะต้องไม่บรรทุกเกินกระเบาะ เพื่อป้องกันไม่ให้วัสดุร่วงหล่นบนถนนซึ่งอาจเป็นอันตรายต่อยานพาหนะอื่น ๆ ได้

#### ๔.๓.๒๒ การรื้อถอน ทำลาย

(๑) การรื้อถอนทำลายสิ่งก่อสร้างที่ต้องขออนุญาตตามกฎหมาย ว่าด้วยการควบคุมอาคาร ผู้รับจ้างต้องมีวิศวกรกำหนดขั้นตอน วิธีการและควบคุมดูแลการทำงานและจัดการอบรมหรือชี้แจงเกี่ยวกับขั้นตอนและวิธีการรื้อถอนทำลายสิ่งก่อสร้างก่อนเริ่มปฏิบัติงาน

(๒) ก่อนการรื้อถอนทำลายสิ่งก่อสร้าง ให้ตัดไฟฟ้า ก๊าซ ประปา ใต้น้ำ หรือพลังงานอื่นๆ

(๓) เคลื่อนย้ายสารเคมี วัตถุไวไฟ วัตถุอันตรายอื่นๆ ออกให้หมด

(๔) เอาของแหลมคม กระจุก หรือวัสดุอื่นที่หลุดร่วงหรือแตกได้ย้ายออกให้หมด ก่อนการรื้อถอนทำลาย

(๕) จัดให้มีแผงรับวัสดุที่อาจร่วงหล่นจากการรื้อถอน และแผงรับวัสดุต้องมีความมั่นคง แข็งแรงและขนาดใหญ่เพียงพอที่จะสามารถรองรับวัสดุที่ร่วงหล่นได้อย่างปลอดภัย

(๖) ให้มีการฉีดน้ำหรือใช้วิธีอื่นที่เหมาะสมเพื่อป้องกันหรือขจัดฝุ่นตลอดเวลาทำงาน

(๗) ในกรณีที่ทำการรื้อถอนทำลายด้วยวัตถุระเบิด ให้มีผู้ชำนาญการด้านวัตถุระเบิด และวิศวกรเป็นผู้ควบคุมงาน และกำหนดวิธีการป้องกันอันตรายตลอดเวลาทำงาน

(๘) ให้มีการขนย้ายวัสดุที่รื้อถอนทำลายแล้วออกจากบริเวณที่รื้อถอนทำลายหรือจัดเก็บให้ปลอดภัย

#### ๔.๓.๒๓ การบำรุงรักษา (การรักษาสภาพ)

ผู้รับจ้างจะต้องจัดเตรียมอุปกรณ์ด้านความปลอดภัย ตามมาตรฐานที่จำเป็นเพื่อใช้ในการก่อสร้าง รวมทั้งบำรุงรักษาให้อยู่ในสภาพดีสมบูรณ์และใช้งานได้ปกติ เช่น อุปกรณ์ป้องกันความปลอดภัยส่วนบุคคล เครื่องกัน แฉกกัน ป้าย ไฟสัญญาณ ฯลฯ

#### ๔.๓.๒๔ การจัดสภาวะแวดล้อมในการทำงาน

(๑) ในบริเวณทำงานจะต้องมีเสียงดังไม่เกินมาตรฐาน แต่ต้องไม่เกิน ๑๔๐ dB(A)

(๒) ในบริเวณที่ทำงานที่มีแสงจ้าจะต้องมีแผงม่านกันแสงสว่างโดยรอบ

(๓) อุปกรณ์ที่เกิดความร้อนสะสมมากกว่า ๔๕ องศาเซลเซียส ต้องมีฉนวนหุ้ม แผงป้ายเตือน

(๔) ฝุ่น ไอ ฟูม ผงควั่น ละอองสารเคมี จะต้องถูกดูดกำจัดมิให้ฟุ้งกระจาย โดยเด็ดขาดและไม่เกินมาตรฐานความเข้มข้นที่กฎหมายกำหนด

(๕) บริเวณก่อสร้างที่มีน้ำท่วมขัง ผู้รับจ้างจะต้องจัดหาเครื่องสูบน้ำ สำหรับสูบน้ำออกจากบริเวณดังกล่าว

(๖) ในการทำงานในสถานที่อับอากาศ งานประต่อน้ำ งานในบริเวณที่สภาพแวดล้อมเป็นอันตราย ผู้รับจ้างจะต้องเสนอขั้นตอนการดำเนินงานตามกฎหมายกำหนดมาให้ผู้ควบคุมงานทราบด้วย

#### ๔.๓.๒๕ การรายงานสภาพการณ์ด้านอุบัติเหตุ

(๑) ผู้รับจ้างต้องส่งรายงานการประสบอุบัติเหตุ อันตราย การบาดเจ็บ และเหตุการณ์ที่อาจทำให้เกิดอันตรายหรือการบาดเจ็บซึ่งเกี่ยวกับคนเครื่องจักร ตลอดจนยานพาหนะในบริเวณก่อสร้างให้ กฟผ. ทราบทุกครั้งโดยเร็ว นับจากเหตุการณ์นั้นเกิดขึ้น ในกรณีอุบัติเหตุที่ร้ายแรงต้องแจ้งด้วยวาจาไปที่ผู้ควบคุมงาน หรือเจ้าหน้าที่ความปลอดภัยของ กฟผ. ทันที

(๒) ในกรณีที่เกิดอุบัติเหตุร้ายแรง ผู้รับจ้างจะต้องไม่เคลื่อนย้ายสิ่งของใดๆ ก่อนที่เจ้าหน้าที่ของ กฟผ. เข้าทำการตรวจสอบ

(๓) ผู้รับจ้างจะต้องรับผิดชอบความปลอดภัยทั้งหมดต่อลูกจ้าง และบุคคลอื่นที่เกี่ยวข้องในงานก่อสร้าง ในกรณีที่มิข้อสงสัยในข้อกำหนดทั่วไปสำหรับการดำเนินงานด้านความปลอดภัย หรือข้อกำหนดฉบับนี้ไม่ได้ครอบคลุมถึง ให้ผู้รับจ้างใช้กฎหมายด้านความปลอดภัย ข้อปฏิบัติเพื่อความปลอดภัยในการปฏิบัติงานของฝ่ายพัฒนาคุณภาพและความปลอดภัย ของ กฟผ. หรือมาตรฐานของสถาบันอื่นที่ กฟผ. เชื่อถือ เช่น Manual Of Accident Prevention In Construction ของ AGCA เป็นต้น

#### ๕. การประกันภัย

สำหรับงานในหัวข้อ ๔.๒.๑ และงานที่มีความเสี่ยงสูง

๕.๑ ผู้รับเหมาจะต้องจัดทำประกันภัยงานระหว่างการก่อสร้าง โดยต้องครอบคลุมระยะเวลางานก่อสร้างจนกว่าผู้รับเหมาจะส่งมอบงานให้ กฟผ. โดยมีความคุ้มครองดังนี้

๕.๑.๑ กรมธรรม์ประกันภัยระหว่างการก่อสร้าง (Contractor's All Risk Insurance) จะต้องคุ้มครองความเสียหายที่มีต่องานที่ทำการก่อสร้าง โดยมีทุนประกันภัยไม่ต่ำกว่ามูลค่างานตามสัญญา โดยในกรมธรรม์ต้องระบุชื่อ กฟผ. และผู้รับเหมา และผู้รับเหมาช่วงเป็นผู้เอาประกันภัยร่วม

๕.๑.๒ กรมธรรม์ประกันภัย จะต้องคุ้มครองรวมถึงความเสียหายต่อทรัพย์สินทุกชนิดที่มีอยู่เดิมของผู้ว่าจ้างซึ่งอยู่ในสถานที่ที่ทำการก่อสร้าง

๕.๑.๓ กรมธรรม์ประกันภัย จะต้องคุ้มครองความสูญเสียหรือเสียหายต่อทรัพย์สินรวมถึงการบาดเจ็บเสียชีวิตของบุคคลภายนอกที่เกิดจากงานที่ทำการก่อสร้าง

๕.๒ การประกันภัยระหว่างการก่อสร้าง จะต้องทำกับบริษัทที่เชื่อถือได้และส่งมอบสำเนากรมธรรม์ให้ กฟผ. ภายใน ๓๐ วัน หลังจากลงนามในสัญญา กฟผ. สงวนไว้ซึ่งสิทธิ์ที่จะให้ผู้รับจ้างดำเนินการแก้ไขและเปลี่ยนแปลงในข้อความและเงื่อนไขในกรมธรรม์นี้เพื่อปกป้องผลประโยชน์ของ กฟผ. โดย กฟผ. จะเป็นผู้ได้รับประโยชน์จากการประกันนี้

บัญชี ๓ เงื่อนไขด้านความปลอดภัย

Table 1 Safety Criteria and Conditions

หน่วยงานผู้ว่าจ้าง : Project Owner :	
งานที่ว่าจ้าง : ก่อสร้างสายส่งไฟฟ้าแรงสูง Project/Contract Name : Supply and Construction of Transmission Line	ระยะเวลาที่ว่าจ้าง : Project/Contract Period/Duration :
การส่งมอบพื้นที่ <input checked="" type="checkbox"/> ส่งมอบพื้นที่ <input type="checkbox"/> ไม่ได้ส่งมอบพื้นที่ Work Area Hand Over <input checked="" type="checkbox"/> Area is handed over to Contractor <input type="checkbox"/> Area is <u>not</u> handed over to Contractor	
กลุ่มงานของผู้รับจ้าง Contractor Category	<input type="radio"/> กลุ่มที่ ๑ กลุ่มงานที่มีความเสี่ยงต่ำ (Low Risk Contract) <input type="radio"/> Group 1 Low Risk Contract <input type="radio"/> กลุ่มที่ ๒ กลุ่มงานที่มีความเสี่ยงปานกลาง (Medium Risk Contract) <input type="radio"/> Group 2 Medium Risk Contract <input checked="" type="radio"/> กลุ่มที่ ๓ กลุ่มงานที่มีความเสี่ยงสูง (High Risk Contract) <input checked="" type="radio"/> Group 3 High Risk Contract
๑. รายละเอียดกิจกรรมด้านความปลอดภัย ที่ต้องดำเนินงานตามกลุ่มงานของผู้รับจ้าง 1. Safety Activities Classified by Contractor Category	
<input checked="" type="checkbox"/>	๑.๑ จัดทำแผนงานความปลอดภัย ให้ผู้ว่าจ้างตรวจสอบและเห็นชอบก่อนเริ่มปฏิบัติงานตามสัญญา อย่างน้อย ดังนี้ 1.1 Before commencement of work, Contractor shall prepare a safety plan for EGAT's prior approval, details of which shall include the following topics: (๑) การตรวจสอบพื้นที่ อุปกรณ์ เครื่องจักร และเครื่องมือ (1) Working Area, Tools, Machine and Equipment Inspection (๒) การฝึกอบรมให้ความรู้ด้านความปลอดภัยในการทำงาน (2) Safety Training (๓) การรณรงค์ส่งเสริมความปลอดภัยในการทำงาน (3) Workplace Safety Promotion (๔) การเตรียมความพร้อม และการตอบโต้เหตุฉุกเฉิน (4) Emergency Response (๕) รายงานการค้นหาและวิเคราะห์อุบัติเหตุที่เกิดขึ้น (5) Accident Investigation Report
<input checked="" type="checkbox"/>	๑.๒ การชี้บ่งอันตราย และประเมินความเสี่ยงกิจกรรมและการดำเนินงานของผู้รับจ้าง ซึ่งมีผลกระทบต่อหน่วยงาน ลูกจ้างของผู้รับจ้าง และผู้มีส่วนได้เสียในสถานที่ทำงาน ให้ดำเนินการ ดังนี้ 1.2 Hazard identification and risk assessment, activities and operations of Contractor that impact EGAT, Contractor's workers and other interested parties in workplace;



	<p><input checked="" type="checkbox"/> (๑) กรณีหน่วยงานผู้ว่าจ้างส่งมอบพื้นที่ ให้ผู้รับจ้างจัดทำการวิเคราะห์งานเพื่อความปลอดภัย (Job Safety Analysis) หรือวิธีการอื่นใด และจัดส่งเอกสารให้หน่วยงานผู้ว่าจ้างทวนสอบความครบถ้วนและเหมาะสม</p> <p><input checked="" type="checkbox"/> (1) In case area is handed over to Contractor, Contractor shall perform a job safety analysis or other methods and send them to Project Owner for approval.</p> <p><input type="checkbox"/> (๒) กรณีหน่วยงานผู้ว่าจ้างไม่ได้ส่งมอบพื้นที่ ให้พิจารณาทางเลือกอย่างใดอย่างหนึ่ง ดังนี้</p> <p><input type="checkbox"/> (2) In case area is <u>not</u> handed over to Contractor, Project Owner shall consider option for hazard identification and risk assessment as follows:</p> <p>(ก) ให้ผู้ว่าจ้างจัดทำการวิเคราะห์งานเพื่อความปลอดภัย หรือวิธีการอื่นใด</p> <p>(a) Project Owner shall perform a job safety analysis or other methods.</p> <p>(ข) ให้ผู้รับจ้างจัดทำการวิเคราะห์งานเพื่อความปลอดภัย หรือวิธีการอื่นใด และจัดส่งเอกสารให้หน่วยงานผู้ว่าจ้างทวนสอบความครบถ้วน และเหมาะสม</p> <p>(b) Contractor shall perform a job safety analysis or other methods and report to Project Owner for approval.</p>
<p><input checked="" type="checkbox"/></p>	<p>๑.๓ จัดให้มีการตรวจสุขภาพลูกจ้างของผู้รับจ้างที่ทำงานเกี่ยวกับปัจจัยเสี่ยง โดยแพทย์แผนปัจจุบันชั้นหนึ่งที่ได้รับใบอนุญาตประกอบวิชาชีพเวชกรรมด้านอาชีวเวชศาสตร์ มีเงื่อนไข ดังนี้</p> <p>1.3 Contractor shall provide health checkup of contractor's workers who expose to risk factors by occupational physician or those trained in occupational medicine as follows:</p> <p><input checked="" type="checkbox"/> (๑) กรณีสัญญาจ้างตั้งแต่ ๑๘๐ วัน ขึ้นไป จัดให้มีการตรวจสุขภาพลูกจ้างครั้งแรกให้เสร็จสิ้น ภายใน ๓๐ วัน นับตั้งแต่วันที่ลูกจ้างเข้าทำงาน และตรวจสุขภาพครั้งต่อไปอย่างน้อยปีละหนึ่งครั้งตามปีปฏิทิน</p> <p><input checked="" type="checkbox"/> (1) In case of one hundred and eighty (180) days or more Contract period, Contractor shall provide health checkup of contractor's workers within thirty (30) days from the date of the first working day and consecutive health checkups shall be provided at least once a year.</p> <p><input type="checkbox"/> (๒) กรณีสัญญาจ้างไม่ถึง ๑๘๐ วัน จัดให้มีการตรวจสุขภาพลูกจ้างครั้งแรกให้เสร็จสิ้น ภายใน ๓๐ วัน นับตั้งแต่วันที่ลูกจ้างเข้าทำงานและตรวจสุขภาพครั้งต่อไปอย่างน้อยปีละหนึ่งครั้งตามปีปฏิทิน หรือให้แสดงใบรับรองแพทย์ของลูกจ้างที่มีระยะเวลาไม่เกิน ๓๐ วัน</p> <p><input type="checkbox"/> (2) In case of less than one hundred and eighty (180) days Contract period, Contractor shall provide health checkup of Contractor's workers within thirty (30) days from the date of the first working day and consecutive health checkups shall be provided at least once a year or medical certificates of Contractor's workers which lasts no longer than thirty (30) days shall be shown.</p> <p><input type="checkbox"/> (๓) กรณีปฏิบัติงานในที่อับอากาศ ลูกจ้างต้องมีความแข็งแรง สามารถทำงานในที่อับอากาศได้ โดยให้ระบุความเห็นของแพทย์ที่บ่งบอกสถานะสุขภาพของลูกจ้างที่มีผลกระทบ หรือเป็นอุปสรรคต่อการทำงานหรือลักษณะงานที่ได้รับมอบหมายของลูกจ้าง พร้อมทั้งลงลายมือชื่อแพทย์แผนปัจจุบันชั้นหนึ่ง (เวชกรรมด้านอาชีวเวชศาสตร์หรือผ่านการอบรมด้านอาชีวเวชศาสตร์) ว่าสามารถเข้าทำงานในที่อับอากาศได้ครั้งต่อไปอย่างน้อยปีละหนึ่งครั้งตามปีปฏิทิน ทั้งนี้ ผลการตรวจสุขภาพ จะต้องนำมาแสดงต่อผู้ควบคุมงาน หรือผู้บริหารสัญญา ก่อนมีการเริ่มดำเนินการเข้าทำงานในที่อับอากาศ</p>

	<input type="checkbox"/> (3) In case of work in confined space, Contractor's workers shall be so healthy that they can work in such space. In this regard, medical certificates to be issued by occupational physicians shall state Contractor's workers health condition that may affect or impede their ability to work in such confined space. This health checkup for workers in confined space shall be performed at least once a year. Medical certificates shall also be presented to Supervisor of Project Owner before working in confined space.
<input checked="" type="checkbox"/>	<p>๑.๔ การค้นหาความจำเป็นในการใช้อุปกรณ์คุ้มครองความปลอดภัยส่วนบุคคล ให้ดำเนินการ ดังนี้</p> <p>1.4 Analysis for need of personal protection equipment;</p> <p><input checked="" type="checkbox"/> (๑) กรณีหน่วยงานผู้ว่าจ้างส่งมอบพื้นที่ ให้ผู้รับจ้างค้นหาความจำเป็นในการใช้อุปกรณ์คุ้มครองความปลอดภัยส่วนบุคคลให้เหมาะสมกับลักษณะความเสี่ยง และจัดส่งเอกสารให้หน่วยงานผู้ว่าจ้างทวนสอบความครบถ้วน และเหมาะสม</p> <p><input checked="" type="checkbox"/> (1) In case area is handed over to Contractor, Contractor shall analyze the need for personal protection equipment appropriate for risk condition and report to Project Owner for approval.</p> <p><input type="checkbox"/> (๒.) กรณีหน่วยงานผู้ว่าจ้างไม่ได้ส่งมอบพื้นที่ ให้ผู้ว่าจ้างค้นหาความจำเป็นในการใช้อุปกรณ์คุ้มครองความปลอดภัยส่วนบุคคลให้เหมาะสมกับลักษณะความเสี่ยง</p> <p><input type="checkbox"/> (2) In case area is <u>not</u> handed over to Contractor, Project Owner shall analyze the need of personal protection equipment.</p>
<input checked="" type="checkbox"/>	<p>๑.๕ การจัดเตรียมความพร้อมของเครื่องดับเพลิงแบบเคลื่อนย้ายได้ ให้ดำเนินการ ดังนี้</p> <p>1.5 Movable fire extinguisher preparation;</p> <p><input checked="" type="checkbox"/> (๑) กรณีหน่วยงานผู้ว่าจ้างส่งมอบพื้นที่ ให้ผู้รับจ้างจัดเตรียมเครื่องดับเพลิงแบบเคลื่อนย้ายได้ให้ครบถ้วนและเหมาะสมกับลักษณะงาน</p> <p><input checked="" type="checkbox"/> (1) In case area is handed over to Contractor, Contractor shall provide appropriate movable fire extinguishers which are sufficient and suitable for work condition.</p> <p><input type="checkbox"/> (๒) กรณีหน่วยงานผู้ว่าจ้างไม่ได้ส่งมอบพื้นที่ ให้ผู้ว่าจ้างจัดเตรียมเครื่องดับเพลิงแบบเคลื่อนย้ายได้ให้ครบถ้วนและเหมาะสมกับลักษณะงาน</p> <p><input type="checkbox"/> (2 ) In case area is <u>not</u> handed over to Contractor, Project Owner shall provide appropriate movable fire extinguishers.</p>
<input checked="" type="checkbox"/>	<p>๑.๖ จัดส่งข้อมูลการดำเนินงานด้านความปลอดภัยของผู้รับจ้างก่อนเริ่มปฏิบัติงานตามสัญญาจ้าง ดังนี้</p> <p>1.6 Contractor shall provide safety operation information before commencing work as follows:</p> <p>(๑) โครงสร้างการบริหารจัดการ บุคลากร หน้าที่ ความรับผิดชอบด้านความปลอดภัย</p> <p>(1) Structure of management, personnel, roles and responsibilities in Safety</p> <p>(๒) หลักสูตร เอกสารแสดงการผ่านการฝึกอบรม และใบอนุญาต ตามที่กฎหมายกำหนด</p> <p>(2) Certificates and licenses of training and permits as required by law</p>

	<p>(๓) การตรวจสุขภาพตามปัจจัยเสี่ยง</p> <p>(3) Occupational health checkup / occupational health examination in accordance with risk factors</p> <p>(๔) การตรวจสอบ ทดสอบ สอบเทียบ และใบรับรองเครื่องมือ เครื่องจักร อุปกรณ์</p> <p>(4) Inspection / testing / calibration and certificate of tools, machine and equipment</p> <p>(๕) ประวัติข้อมูลความสูญเสียและสถิติอุบัติเหตุในอดีต (ถ้ามี)</p> <p>(5) Contractor's safety statistics (if available)</p> <p>(๖) ความสามารถในการปฏิบัติตามมาตรฐาน กฎหมายด้านความปลอดภัย (ถ้ามี)</p> <p>(6) Ability to comply with safety standards and laws (if available)</p>
<input checked="" type="checkbox"/>	<p>๑.๗ ระบบการควบคุมการเข้า-ออก (Access Control) ให้ดำเนินการ ดังนี้</p> <p>1.7 Access control system;</p> <p><input checked="" type="checkbox"/> (๑) กรณีหน่วยงานผู้ว่าจ้างส่งมอบพื้นที่ ให้ผู้รับจ้างจัดให้มีระบบการควบคุมการเข้า-ออกของผู้รับจ้าง ดังนี้</p> <p><input checked="" type="checkbox"/> (1) In case area is handed over to Contractor, Contractor shall provide access control system as follows:</p> <p>(ก) การควบคุมบุคคลเข้า-ออก (Personnel Access Control) กำหนดให้ลูกจ้างของผู้รับจ้างหรือผู้เกี่ยวข้อง ต้องแสดงหรือแขวนบัตรเพื่อใช้แสดงตนผ่านเข้า-ออก</p> <p>(a) Personnel access control by instructing Contractor's workers and other relevant people to show identification card at entrance area and exit area.</p> <p>(ข) การควบคุมการนำสิ่งของเข้า-ออก (Gate Pass) จัดให้มีการควบคุมการนำเครื่องมือ เครื่องจักร อุปกรณ์ รวมทั้งวัสดุและสารเคมีอันตราย ที่ทางเข้า การอยู่ในพื้นที่ และการออกนอกพื้นที่ของผู้รับจ้างหรือผู้เกี่ยวข้อง</p> <p>(B) Gate pass control for tools, machine and equipment including materials and hazardous chemicals at entrance area and exit area.</p> <p>(ค) การควบคุมยานพาหนะเข้า-ออก (Vehicle Access Control) จัดให้มีการควบคุมยานพาหนะที่ใช้สำหรับส่งคนไปยังสถานที่ทำงาน ขนส่งเครื่องมืออุปกรณ์ในการทำงาน ตรวจสอบโดยผู้รับผิดชอบของงานหรือโครงการที่ได้รับมอบหมายจากหน่วยงาน เพื่อควบคุมการจราจรและความปลอดภัยของยานพาหนะเข้า-ออก โดยปฏิบัติตามกฎความปลอดภัยเฉพาะพื้นที่ หรือระเบียบปฏิบัติของหน่วยงาน กฟผ. ที่เกี่ยวข้อง</p> <p>(C) Vehicle access control for all vehicles carrying workers, equipment and tools to site area which shall be inspected by inspector from Project Owner in accordance with local safety rules or EGAT's related rules and regulation.</p> <p><input type="checkbox"/> (๒) กรณีหน่วยงานผู้ว่าจ้างไม่ได้ส่งมอบพื้นที่ ให้ผู้รับจ้างดำเนินการตามระบบการควบคุมการเข้า-ออก ของหน่วยงานผู้ว่าจ้างหรือเจ้าของพื้นที่</p> <p><input type="checkbox"/> (2) In case area is <u>not</u> handed over to Contractor, Contractor shall follow access control system of Owner area.</p>

<input checked="" type="checkbox"/>	<p>๑.๘ กฎความปลอดภัยทั่วไป กฎเฉพาะงาน เครื่องหมายและป้ายสัญลักษณ์ความปลอดภัย ให้ดำเนินการ ดังนี้</p> <p>1.8 General safety rule, specific safety rule, safety sign, and safety symbol;</p> <p><input checked="" type="checkbox"/> (๑) กรณีหน่วยงานผู้ว่าจ้างส่งมอบพื้นที่ ให้ผู้รับจ้างจัดให้มีกฎความปลอดภัย เครื่องหมายและป้ายสัญลักษณ์ความปลอดภัย เพื่อสื่อสารให้เกิดความเข้าใจและนำไปปฏิบัติ</p> <p><input checked="" type="checkbox"/> (1) In case area is handed over to Contractor, Contractor shall provide safety rules, safety signs, and safety symbols and communicate them to all relevant people for implementation.</p> <p><input type="checkbox"/> (๒) กรณีหน่วยงานผู้ว่าจ้างไม่ได้ส่งมอบพื้นที่ ให้ผู้รับจ้างปฏิบัติตามกฎความปลอดภัย เครื่องหมายและป้ายสัญลักษณ์ความปลอดภัยของหน่วยงานผู้ว่าจ้างหรือเจ้าของพื้นที่</p> <p><input type="checkbox"/> (2) In case area is <u>not</u> handed over to Contractor, Contractor shall follow safety rules, safety signs, and safety symbols of Owner area.</p>
<input checked="" type="checkbox"/>	<p>๑.๙ ระบบการแจ้งการกระทำหรือสภาพการณ์ที่ต่ำกว่ามาตรฐาน ให้ดำเนินการ ดังนี้</p> <p>1.9 Report system for unsafe act or under-standard safety condition;</p> <p><input checked="" type="checkbox"/> (๑) กรณีหน่วยงานผู้ว่าจ้างส่งมอบพื้นที่ ให้ผู้รับจ้างจัดให้มีระบบการแจ้งการกระทำหรือสภาพการณ์ที่ต่ำกว่ามาตรฐานของผู้รับจ้าง ดังนี้</p> <p><input checked="" type="checkbox"/> (1) In case area is handed over to Contractor, Contractor shall provide unsafe act or under-standard safety condition report system as follows:</p> <p>(ก) เมื่อลูกจ้างของผู้รับจ้างพบเห็นการกระทำหรือสภาพการณ์ที่ต่ำกว่ามาตรฐาน ต้องแจ้งผู้ควบคุมงานของผู้รับจ้าง เพื่อกำหนดมาตรการแก้ไขและการป้องกัน</p> <p>(a) When Contractor's workers find unsafe act or under-standard safety condition, such worker shall report to Supervisor of Contractor to determine corrective and preventive action.</p> <p>(ข) ผู้ควบคุมงานของผู้รับจ้างต้องรายงานการกระทำหรือสภาพการณ์ที่ต่ำกว่ามาตรฐาน พร้อมมาตรการแก้ไขและการป้องกัน ต่อผู้ควบคุมงานของผู้ว่าจ้าง</p> <p>(b) Supervisor of Contractor shall report unsafe act or under-standard safety condition, including corrective and preventive action to Supervisor of Project Owner.</p> <p><input type="checkbox"/> (๒) กรณีหน่วยงานผู้ว่าจ้างไม่ได้ส่งมอบพื้นที่ ให้ผู้รับจ้างปฏิบัติตามระบบการแจ้งการกระทำหรือสภาพการณ์ที่ต่ำกว่ามาตรฐานของหน่วยงานผู้ว่าจ้างหรือหน่วยงานเจ้าของพื้นที่</p> <p><input type="checkbox"/> (2) In case area is <u>not</u> handed over to Contractor, Contractor shall follow unsafe act or under-standard safety condition report system of Owner area.</p>
<input checked="" type="checkbox"/>	<p>๑.๑๐ ดำเนินการสนทนาความปลอดภัย (Safety Talk) เฉพาะงานที่เสี่ยงอันตราย โดยมีหัวข้ออย่างน้อย ดังนี้</p> <p>1.10 Safety talk only for high risk Contract, the topics of which shall include but not limited to the followings:</p> <p>(๑) งานที่ต้องปฏิบัติ</p> <p>(1) Job description</p>

	<p>(๒) อันตรายที่อาจจะเกิดขึ้นจากการทำงาน ระดับความเสี่ยงของงาน อุบัติเหตุที่เคยเกิดขึ้น รวมทั้งข้อควรระวังพิเศษ</p> <p>(2) Work hazards, work risk, happened accidents including specific caution</p> <p>(๓) มาตรการควบคุมป้องกัน เช่น กฎเฉพาะงาน การอนุญาตเข้าทำงาน การล็อกและการแขวนป้ายเพื่อความปลอดภัย อุปกรณ์คุ้มครองความปลอดภัยส่วนบุคคล</p> <p>(3) Preventive measures such as specific safety rules, work permits, lockout / tag out of safety signs, personal protection equipment</p> <p>(๔) การเตรียมความพร้อมสภาพร่างกายก่อนเริ่มทำงาน</p> <p>(4) Preparation of physical health before work</p>
<input checked="" type="checkbox"/>	<p>๑.๑๑ จัดให้มีการตรวจสอบความปลอดภัยของพื้นที่ อาคาร เครื่องมือ เครื่องจักร อุปกรณ์ ตามแผนที่กำหนด รวมทั้งจัดทำรายงานผลการตรวจสอบให้ผู้ควบคุมงานของหน่วยงานผู้ว่าจ้าง</p> <p>1.11 Contractor shall provide safety inspection of working areas, buildings, tools, machines, and equipment following safety inspection plan and shall prepare safety inspection report as well as provide it to Supervisor of Project Owner.</p>
<input checked="" type="checkbox"/>	<p>๑.๑๒ จัดและดูแลให้ลูกจ้างของผู้รับจ้างสวมใส่อุปกรณ์คุ้มครองความปลอดภัยส่วนบุคคลที่ได้มาตรฐาน โดยลูกจ้างของผู้รับจ้างมีหน้าที่สวมใส่และดูแลรักษาอุปกรณ์คุ้มครองความปลอดภัยส่วนบุคคลให้สามารถใช้งานได้ตามสภาพและลักษณะของงานตลอดระยะเวลาทำงาน</p> <p>1.12 Contractor shall provide personal protection equipment to workers and control them to wear and maintain their personal protection equipment to be in proper condition while working throughout the Contract period.</p>
<input checked="" type="checkbox"/>	<p>๑.๑๓ การขออนุญาตเข้าทำงาน (Work Permit) สำหรับงานตามที่กฎหมายกำหนด และงานหรือพื้นที่ที่มีความเสี่ยงสูง ให้ดำเนินการ ดังนี้</p> <p>1.13 Work permit for specific work required by law and a high-risk work or area;</p> <p><input checked="" type="checkbox"/> (๑) กรณีหน่วยงานผู้ว่าจ้างส่งมอบพื้นที่ ให้ผู้รับจ้างจัดให้มีระบบการขออนุญาตเข้าทำงาน และให้หน่วยงานผู้ว่าจ้างกำกับดูแล ตรวจสอบความครบถ้วน เหมาะสม สำหรับงาน ดังนี้</p> <p><input checked="" type="checkbox"/> (1) In case area is handed over to Contractor, Contractor shall provide work permit system, and Project Owner shall supervise and verify completeness and appropriateness of Contractor's work as follows:</p> <p>(ก) งานในที่อับอากาศ</p> <p>(a) Work in confined spaces</p> <p>(ข) งานในที่ที่มีประกายไฟหรือมีความเสี่ยงจากการระเบิด</p> <p>(b) Work with flash or risk of explosion</p> <p>(ค) งานขุดเจาะ</p> <p>(c) Drilling work</p> <p>(ง) งานในที่ที่มีรังสี</p> <p>(e) Radiation work</p> <p>(จ) งานแหล่งพลังงาน</p>

	<p>(f) Energy source work (ณ) งานที่สูง (f) Work at high altitude (ซ) งานเหนือผิวน้ำ (g) Work above water surface (ซ) งานลิฟต์ขนาดใหญ่หรืออุปกรณ์ยกย้ายขนาดใหญ่ (g) Lifting work or heavy moving / unloading work (ณ) งานสารที่เป็นอันตราย (h) Hazardous chemical work (ญ) งานประดาน้ำ (i) Diving Work (ฎ) งานอื่น ๆ ตามความจำเป็น (j) Other necessary work</p> <p><input type="checkbox"/> (๒) กรณีหน่วยงานผู้ว่าจ้างไม่ได้ส่งมอบพื้นที่ ให้ผู้รับจ้างขออนุญาตเข้าพื้นที่ โดยปฏิบัติตามระบบการขออนุญาตเข้าทำงานของหน่วยงานผู้ว่าจ้างหรือเจ้าของพื้นที่</p> <p><input type="checkbox"/> (2) In case area is <u>not</u> handed over to Contractor, Contractor shall follow work permit system of Project Owner or Area Owner.</p>
<input checked="" type="checkbox"/>	<p>๑.๑๔ ควบคุมการปฏิบัติด้วยการสังเกตการทำงาน (Task Observation) หรือวิธีการอื่นใด โดยหัวหน้างานหรือเจ้าหน้าที่ความปลอดภัยในการทำงานของผู้รับจ้าง ทั้งนี้หน่วยงานผู้ว่าจ้างอาจดำเนินการตามความเหมาะสม โดยพิจารณาตามลักษณะงาน ดังนี้</p> <p>1.14 Supervisor or Safety Officer of Contractor shall control operation by task observation or other methods. However, Project Owner may exercise operation control as it deems appropriate by considering work that has following criteria:</p> <p>(๑) งานที่มีวิธีการปฏิบัติด้านความปลอดภัย (Work Instruction) (1) Required work instruction for safety</p> <p>(๒) งานที่มีกฎความปลอดภัยเฉพาะงานหรือเฉพาะพื้นที่ (2) Required specific safety rules or local rules</p> <p>(๓) งานที่เคยมีประวัติการเกิดอุบัติเหตุระดับความรุนแรงมาก (3) Happened severe accident history</p> <p>(๔) งานที่มีระดับความรุนแรงมาก จากการชี้บ่งอันตรายและประเมินความเสี่ยง (4) High risk work (from risk determination and assessment)</p> <p>(๕) งานใหม่หรืองานที่ไม่ได้ทำเป็นประจำ (5) New work or non-routine work</p> <p>(๖) งานที่ต้องมีระบบการขออนุญาตเข้าทำงาน (6) Required work permit</p>





๑.๑๕ ดำเนินการเมื่อเกิดอุบัติเหตุ ดังนี้

1.15 When incident occurs, Contractor shall;

(๑) แจ้งต่อหน่วยงานผู้ว่าจ้าง โดยทันที ด้วยวาจา โทรศัพท์ โทรสารหรือวิธีอื่นใดที่มีรายละเอียดพอสมควร

(1) Immediately report to Project Owner by verbal, phone, fax, or other methods with appropriate details.

(๒) ห้ามเคลื่อนย้าย เปลี่ยนแปลงพยานวัตถุและพยานแวดล้อม ก่อนที่หน่วยงานผู้ว่าจ้างเข้าทำการตรวจสอบ ณ จุดเกิดเหตุ

(2) Not move or change evidence before Project Owner inspects accident area.

(๓) กรณีเสียชีวิตหรือเกิดอุบัติเหตุร้ายแรง ให้แจ้งต่อพนักงานตรวจความปลอดภัยทันทีที่ทราบ โดยโทรศัพท์ โทรสาร หรือวิธีอื่นใด และแจ้งเป็นหนังสือ (สปร.๕) ภายหลังจากเข้าร่วมการค้นหาสาเหตุอุบัติเหตุ โดยระบุสาเหตุอันตรายที่เกิดขึ้น ความเสียหาย การแก้ไขและวิธีการป้องกันการเกิดซ้ำ ทั้งนี้ ภายใน ๗ วันนับแต่วันเกิดเหตุ

(3) In case of death or severe accident, Contractor shall report to safety inspector immediately by verbal, phone, fax, or other methods and written report in specified form (สปร.5) after incident investigation by indicating accident cause, total loss, corrective and preventive action within seven (7) days from date of accident.

(๔) เมื่อเกิดอุบัติเหตุระดับความรุนแรงมาก (Class A) ต้องแจ้งให้หน่วยงานผู้ว่าจ้างเข้าร่วมในการค้นหาสาเหตุอุบัติเหตุทุกครั้ง สำหรับระดับความรุนแรงปานกลาง หรือระดับความรุนแรงน้อย ให้หน่วยงานผู้ว่าจ้างพิจารณาการมีส่วนร่วมตามความเหมาะสม

(4) When class A of accident occurs, Contractor shall report to Project Owner to participate in accident investigation of every case. For class B or C of accident, Project Owner will consider participation as appropriate.

(๕) จัดให้มีการค้นหาสาเหตุอุบัติเหตุที่เกิดขึ้นกับลูกจ้างของผู้รับจ้างโดยระบุรายละเอียดของเหตุการณ์ สาเหตุขณะนั้น สาเหตุพื้นฐาน กำหนดมาตรการแก้ไขและการป้องกัน

(5) Contractor shall provide incident investigation occurred to Contractor's workers, which include details of incident, immediate cause, basic cause, and determine the corrective and preventive action.

(๖) จัดส่งรายงานผลการค้นหาสาเหตุอุบัติเหตุให้หน่วยงานผู้ว่าจ้าง เพื่อพิจารณาประสิทธิภาพและประสิทธิผล

(6) Contractor shall report incident investigation to Project Owner to consider efficiency and effectiveness of incident investigation.

(๗) ในกรณีที่ลูกจ้างของผู้รับจ้างประสบอันตรายหรือเจ็บป่วยตามกฎหมายว่าด้วยเงินทดแทน ให้ผู้รับจ้างแจ้งการประสบอันตรายหรือเจ็บป่วยต่อสำนักงานประกันสังคม และส่งสำเนาหนังสือแจ้งต่อพนักงานตรวจความปลอดภัยภายใน ๗ วัน พร้อมทั้งส่งสำเนาให้หน่วยงานผู้ว่าจ้าง

(7) When Contractor's workers have accident or illness under compensation law, Contractor shall report such accident or illness of the workers to Social Security Office

	and send a copy of such report to safety inspector within seven (7) days and send another copy to Project Owner.
<input checked="" type="checkbox"/>	<p>๑.๑๖ ดำเนินการเกี่ยวกับการเตรียมความพร้อมและการตอบโต้เหตุฉุกเฉิน</p> <p>1.16 Preparation for emergency response;</p> <p><input checked="" type="checkbox"/> (๑) กรณีหน่วยงานผู้ว่าจ้างส่งมอบพื้นที่ ให้ผู้รับจ้างดำเนินการ ดังนี้</p> <p><input checked="" type="checkbox"/> (1) In case area is handed over to Contractor, Contractor shall conduct emergency response as follows:</p> <p>(ก) วิเคราะห์และประเมินความจำเป็นในการรองรับและตอบโต้เหตุฉุกเฉิน</p> <p>(a) Analyze and assess the need for emergency response</p> <p>(ข) จัดทำแผนรองรับและตอบโต้เหตุฉุกเฉิน</p> <p>(b) Make emergency response plan</p> <p>(ค) ฝึกซ้อมแผนรองรับและตอบโต้เหตุฉุกเฉิน</p> <p>(c) Do emergency response exercise</p> <p>(ง) ประเมินผลการฝึกซ้อมและประเมินผลภายหลังการเกิดเหตุจริงทุกครั้ง</p> <p>(d) Evaluate result of emergency response exercise and after real accident occurs every time</p> <p>(จ) รายงานผลการฝึกซ้อม</p> <p>(e) Report result of emergency response exercise</p> <p><input type="checkbox"/> (๒) กรณีหน่วยงานผู้ว่าจ้างไม่ได้ส่งมอบพื้นที่ ให้ผู้รับจ้างปฏิบัติตามแผนรองรับและตอบโต้เหตุฉุกเฉินของหน่วยงานผู้ว่าจ้างหรือหน่วยงานเจ้าของพื้นที่</p> <p><input type="checkbox"/> (2) In case area is <u>not</u> handed over to Contractor, Contractor shall follow emergency response plan of Owner area.</p>
<input checked="" type="checkbox"/>	<p>๑.๑๗ จัดส่งรายงานด้านความปลอดภัย เพื่อใช้ในการประเมินผลและติดตามการปฏิบัติตามความปลอดภัยทุกเดือน ดังนี้</p> <p>1.17 Contractor shall send safety report to Project Owner every month for safety evaluation and monitoring. Safety report should have following topics:</p> <p>(๑) จำนวนลูกจ้างและจำนวนชั่วโมงการทำงาน</p> <p>(1) Number of workers and their working-hours</p> <p>(๒) จำนวนการเกิดอุบัติเหตุ</p> <p>(2) Number of incidents</p> <p>(๓) รายงานผลการดำเนินงานตามแผนงานความปลอดภัย</p> <p>(3) Safety performance report</p> <p>(๔) สรุปผลการตรวจสอบความปลอดภัยของพื้นที่ อาคาร เครื่องมือ เครื่องจักร อุปกรณ์</p> <p>(4) Safety inspection report for working areas, buildings, tools, machines, and equipment</p> <p>(๕) รายงานการประชุมคณะกรรมการความปลอดภัย (ถ้ามี)</p> <p>(5) Safety committee meeting report (if available)</p>



๒. ชี้แจงกฎหมาย ระเบียบด้านความปลอดภัยที่เกี่ยวข้อง

2. Identify Relevant Safety Laws and Regulations

๒.๑ กฎหมายความปลอดภัย

2.1 Safety Laws

- ☒ พระราชบัญญัติ ความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๔
- ☒ Occupational Safety, Health and Environment Act B.E. 2554 (A.D.2011)
- ☒ กฎกระทรวง กำหนดมาตรฐานในการบริหารและการจัดการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๔
- ☒ Ministerial Regulation on the Prescribing Of Standard for Administration and Management of Occupational Safety, Health and Environment B.E. 2549 (A.D.2006)
- ☒ กฎกระทรวง กำหนดมาตรฐานในการบริหารและการจัดการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน (ฉบับที่ ๒) พ.ศ. ๒๕๕๓
- ☒ Ministerial Regulation on the Prescribing Of Standard for Administration and Management of Occupational Safety, Health and Environment (No.2) B.E. 2553 (A.D.2010)
- ☒ กฎกระทรวง กำหนดหลักเกณฑ์และวิธีการตรวจสอบสุขภาพของลูกจ้าง และส่งผลการตรวจแก่พนักงานตรวจแรงงาน พ.ศ. ๒๕๔๗
- ☒ Ministerial Regulation on the Prescribing of Criteria and Method of Conducting Health Check Up of Employees and Forwarding the Results of Health Check Up to Labour Inspector B.E. 2547 (A.D.2004)
- ☐ กฎกระทรวง กำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับที่อับอากาศ พ.ศ. ๒๕๖๒
- ☐ Ministerial Regulation on the Prescribing of Standard for Administration and Management of Occupational Safety, Health and Work Environment in Confined Space B.E. 2562 (A.D.2019)
- ☒ กฎกระทรวง กำหนดมาตรฐานในการบริหารและการจัดการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับงานประดาน้ำ พ.ศ. ๒๕๕๘ (เฉพาะกรณีมีงานก่อสร้างใต้น้ำ)
- ☒ Ministerial Regulation on the Prescribing of Standard for Administration and Management of Occupational Safety, Health and Work Environment in Relation to Diving Work B.E. 2548 (A.D.2005) (In case of underwater construction work)
- ☐ กฎกระทรวง กำหนดมาตรฐานในการบริหารและการจัดการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับรังสีชนิดก่อกัมมันตภาพรังสี พ.ศ. ๒๕๕๗
- ☐ Ministerial Regulation on the Prescribing of Standard for Administration and Management of Occupational Safety, Health and Work Environment in Relation to Ionizing Radiation B.E. 2547 (A.D.2004)
- ☒ กฎกระทรวง กำหนดมาตรฐานในการบริหารและการจัดการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับงานก่อสร้าง พ.ศ. ๒๕๕๑
- ☒ Ministerial Regulation on the Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment for Construction Work B.E. 2551 (A.D.2008)

- ☒ กฎกระทรวง กำหนดมาตรฐานในการบริหารและการจัดการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับเครื่องจักร ปั่นจั่น และหม้อน้ำ พ.ศ. ๒๕๕๒
- ☒ Ministerial Regulation on the Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment relating to Machines, Cranes and Boilers B.E. 2552 (A.D.2009)
- ☒ กฎกระทรวง กำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับการป้องกันและระงับอัคคีภัย พ.ศ. ๒๕๕๕
- ☒ Ministerial Regulation on the Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment for Prevention And Extinguishment of Fire B.E. 2555 (A.D.2012)
- ☒ กฎกระทรวง กำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับสารเคมีอันตราย พ.ศ. ๒๕๕๖
- ☒ Ministerial Regulation on the Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in Relation to Hazardous Chemical B.E. 2 5 5 6 (A.D.2013)
- ☒ กฎกระทรวง กำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย. และสภาพแวดล้อมในการทำงานเกี่ยวกับไฟฟ้า พ.ศ. ๒๕๕๘
- ☒ Ministerial Regulation on the Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in Relation to Electricity B.E. 2558 (A.D.2015)
- ☒ กฎกระทรวง กำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับความร้อน แสงสว่าง และเสียง พ.ศ. ๒๕๕๙
- ☒ Ministerial Regulation on the Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in Relation to Heat, Light and Noise B.E. 2559 (A.D.2016)
- ☒ กฎกระทรวง ว่าด้วยการจัดสวัสดิการในสถานประกอบกิจการ พ.ศ. ๒๕๔๘
- ☒ Ministerial Regulation Arrangement Of Welfare In Workplace, B.E.2548 (A.D.2005)
- ☒ อื่น ๆ (ระบุ) กฎหมายด้านความปลอดภัยอื่นๆ
- ☒ Others (specify) Other Safety Laws

## ๒.๒ ระเบียบด้านความปลอดภัยของหน่วยงาน/กฟผ.

### EGAT Safety Regulations

- ☒ ระเบียบ กฟผ. ที่ ๑๒๙ ว่าด้วย ข้อกำหนดสำหรับการดำเนินงานด้านความปลอดภัยในการทำงานเกี่ยวกับงานก่อสร้าง
- ☒ EGAT's Rule No. 129 : Specifications for Management of Safety in Relation to Construction Work
- ☐ ระเบียบ กฟผ. ที่ ๑๐๐ ว่าด้วย มาตรฐานเครื่องหมายความปลอดภัย
- ☐ EGAT's Rule No. 100 : Safety Sign Standard

- ☐ ระเบียบ กพผ. ที่ ๖๖ ว่าด้วยข้อกำหนดการแขวนป้ายเพื่อความปลอดภัย พ.ศ. ๒๕๔๘
- ☐ EGAT's Rule No. 66 : Specifications for Safety Tag out B.E. 2548
- ☐ อื่น ๆ (ระบุ) .....
- ☐ Others (specify).....

**๓. โครงสร้างการบริหารจัดการ บุคลากร และหน้าที่ ความรับผิดชอบด้านความปลอดภัย**  
**Structure of management personnel and roles responsibilities in Safety**

- ☒ คณะกรรมการความปลอดภัย อาชีวอนามัยและสภาพแวดล้อมในการทำงาน
- ☒ Occupational Safety, Health and Environment Committee
- ☐ หน่วยงานความปลอดภัย
- ☐ Safety Department
- ☒ เจ้าหน้าที่ความปลอดภัย
- ☒ Safety Officer
- ☒ หัวหน้างาน
- ☒ Supervisor
- ☒ ลูกจ้างของผู้รับจ้าง
- ☒ Contractor's Workers
- ☐ อื่น ๆ (ระบุ) .....
- ☐ Others (specify).....

**เกณฑ์พิจารณาหน่วยงานและบุคลากร**

**Criteria for Safety Department and Personnel Requirement**

ประเภท กิจการ Categories of Businesses or Workplaces	จำนวนลูกจ้าง Number of Contractor's Workers	จป.บริหาร Safety Officer in Management Level	จป.หัวหน้า งาน Safety Officer in Supervising Level	จป.วิชาชีพ Safety Officer in Professional Level	จป.เทคนิค ขั้นสูง Safety Officer in Advanced Technical Level	จป.เทคนิค Safety Officer in Technical Level	หน่วยงาน ความ ปลอดภัย Safety Department
(๑)  (1)	๒ คน ขึ้นไป  2 persons or more	ระดับบริหารทุก คน All management levels	หัวหน้างาน ทุกคน All supervising levels	อย่างน้อย ๑ คน / At least 1 person		X	จัดให้มี  /
(๒) ถึง (๕) (2) to (5)	๒ – ๑๙ คน  2-19 persons	ระดับบริหารทุก คน All management levels	หัวหน้างาน ทุกคน All supervising levels	X	X	X	X

	๒๐ - ๔๙  20-49 persons	ระดับบริหารทุก คน  All management levels	หัวหน้างาน ทุกคน  All supervising levels	X	X	๑ คน ปฏิบัติงาน ความ ปลอดภัย ไม่น้อยกว่า วันละ ๑ ช. ม. / 1 person safety work not less than 1 hour per day	X
	๕๐ - ๙๙  50-99 persons	ระดับบริหารทุก คน  All management levels	หัวหน้างาน ทุกคน  All supervising levels	X	๑ คน / 1 person	X	X
	๑๐๐ คนขึ้นไป 100 persons or more	ระดับบริหารทุก คน  All management levels	หัวหน้างาน ทุกคน  All supervising levels	อย่างน้อย ๑ คน At least 1 person	X	X	X
	๒๐๐ คนขึ้นไป 200 persons or more	ระดับบริหารทุก คน  All management levels	หัวหน้างาน ทุกคน  All supervising levels	อย่างน้อย ๑ คน At least 1 person	X	X	จัดให้มี / 
(๖) ถึง (๑๔) (6) to (14)	๒๐ คนขึ้นไป 20 persons or more	ระดับบริหารทุก คน  All management levels	หัวหน้างาน ทุกคน  All supervising levels	X	X	X	X
<b>Note :</b> / = Required X = Not required							

เกณฑ์พิจารณาคณะกรรมการความปลอดภัยฯ Criteria for Committee Number		
ประเภทกิจการ Categories of Businesses or Workplaces	จำนวนลูกจ้าง Number of Contractor's Workers	คณะกรรมการความปลอดภัยฯ (คปอ.) Occupational Safety, Health and Environment Committee
(๑) ถึง (๑๔) (1) to (14)	๕๐ – ๙๙ คน 50-99 persons	ไม่น้อยกว่า ๕ คน at least five (5) members of Committee
(๑) ถึง (๑๔) (1) to (14)	๑๐๐ – ๔๙๙ คน 100-499 persons	ไม่น้อยกว่า ๗ คน at least seven (7) members of Committee
(๑) ถึง (๑๔) (1) to (14)	๕๐๐ คนขึ้นไป 500 persons or more	ไม่น้อยกว่า ๑๑ คน at least eleven (11) members of Committee
๔. คุณสมบัติด้านความปลอดภัยเบื้องต้นของผู้รับจ้าง 4. Basic safety requirements of Contractor		
๔.๑ หลักสูตร เอกสารแสดงการผ่านการฝึกอบรม และใบอนุญาต ตามที่กฎหมายกำหนด 4.1 Courses and documents showing training and licenses as required by law		
(๑) การบริหารจัดการ (1) Management		
<input checked="" type="checkbox"/> เจ้าหน้าที่ความปลอดภัยในการทำงานระดับบริหาร พร้อมหลักฐานการขึ้นทะเบียน <input checked="" type="checkbox"/> Safety Officer in management level with proof of registration <input checked="" type="checkbox"/> เจ้าหน้าที่ความปลอดภัยในการทำงานระดับหัวหน้างาน พร้อมหลักฐานการขึ้นทะเบียน <input checked="" type="checkbox"/> Safety Officer in supervising level with proof of registration <input checked="" type="checkbox"/> เจ้าหน้าที่ความปลอดภัยในการทำงานระดับเทคนิค พร้อมหลักฐานการขึ้นทะเบียน <input checked="" type="checkbox"/> Safety Officer in technical level with proof of registration <input checked="" type="checkbox"/> เจ้าหน้าที่ความปลอดภัยในการทำงานระดับเทคนิคขั้นสูง พร้อมหลักฐานการขึ้นทะเบียน <input checked="" type="checkbox"/> Safety Officer in advanced technical level with proof of registration <input checked="" type="checkbox"/> เจ้าหน้าที่ความปลอดภัยในการทำงานระดับวิชาชีพ พร้อมหลักฐานการขึ้นทะเบียน <input checked="" type="checkbox"/> Safety Officer in professional level with proof of registration <input checked="" type="checkbox"/> คณะกรรมการความปลอดภัย อาชีวอนามัยและสภาพแวดล้อมในการทำงานของสถานประกอบกิจการ <input checked="" type="checkbox"/> Occupational Safety, Health and Environment Committee <input checked="" type="checkbox"/> ความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานสำหรับลูกจ้างทั่วไปและลูกจ้างเข้าทำงานใหม่ <input checked="" type="checkbox"/> Occupational safety, health and environment for general workers / employees and newly-recruited workers / employees <input type="checkbox"/> หัวหน้าหน่วยงานความปลอดภัย <input type="checkbox"/> Chief of Safety Department		

<b>(๒) การทำงานในที่อับอากาศ</b> <b>(2) Work in Confined Spaces</b>
<input type="checkbox"/> ผู้อนุญาต <input type="checkbox"/> Licensor <input type="checkbox"/> ผู้ควบคุมงาน <input type="checkbox"/> Supervisor <input type="checkbox"/> ผู้ช่วยเหลือ <input type="checkbox"/> Assistant <input type="checkbox"/> ผู้ปฏิบัติงานในที่อับอากาศ <input type="checkbox"/> Workers / Employees permitted to enter to work <input type="checkbox"/> ใบรับรองผลการตรวจสุขภาพพิเศษตามกฎหมายกำหนด <input type="checkbox"/> Certificate for special health checkup result as required by law
<b>(๓) การทำงานเกี่ยวกับรังสี</b> <b>(3) Radiation Work</b>
<input type="checkbox"/> การป้องกันอันตรายทางรังสี ของผู้รับผิดชอบดำเนินการทางด้านเทคนิคในเรื่องรังสี <input type="checkbox"/> Radiation danger prevention of responsible employees for technical radiation <input type="checkbox"/> อันตรายและวิธีการป้องกันอันตรายจากรังสีก่อนเข้ารับหน้าที่สำหรับลูกจ้างที่ปฏิบัติงานเกี่ยวกับรังสี <input type="checkbox"/> Danger and method to prevent danger from radiation before resuming for employees working in relation to radiation
<b>(๔) การทำงานเกี่ยวกับงานก่อสร้าง</b> <b>(4) Construction Work</b>
<input checked="" type="checkbox"/> อบรมการใช้เครื่องจักร รหัสสัญญาณต่าง ๆ <input checked="" type="checkbox"/> Machinery use and relevant signals training <input checked="" type="checkbox"/> อบรมการช่วยเหลือและการปฐมพยาบาลเบื้องต้น <input checked="" type="checkbox"/> First-aid and rescue training <input checked="" type="checkbox"/> อบรมผู้บังคับเครื่องตอกเสาเข็ม <input checked="" type="checkbox"/> Pile driver operator training <input checked="" type="checkbox"/> อบรมความปลอดภัยในการใช้เครื่องจักรที่อาจเกิดอันตราย <input checked="" type="checkbox"/> Dangerous machinery use training <input checked="" type="checkbox"/> ผู้บังคับปั้นจั่น ผู้ให้สัญญาณแก่ผู้บังคับปั้นจั่น ผู้ยึดเกาะวัสดุ หรือผู้ควบคุมการใช้ปั้นจั่น <input checked="" type="checkbox"/> Crane or derrick operators, the signal givers to the crane or derrick operators, the material holders or the crane or derrick operating supervisors <input type="checkbox"/> อบรมการใช้ลิฟต์ขนส่งวัสดุชั่วคราวและลิฟต์โดยสารชั่วคราวในงานก่อสร้าง <input type="checkbox"/> Temporary freight and passenger elevators training <input type="checkbox"/> อบรมวิธีทำงานในอุโมงค์และวิธีป้องกันอันตรายแก่ลูกจ้างก่อนเข้าทำงานในอุโมงค์ <input type="checkbox"/> Training for Work in tunnel and danger preventive measures for the employee before working in tunnel <input type="checkbox"/> อบรมและฝึกซ้อมกรณีเกิดภัยธรรมชาติ

<input type="checkbox"/> Natural disaster case practicing and training <input checked="" type="checkbox"/> อบรมขั้นตอนและวิธีการรื้อถอนทำลายสิ่งก่อสร้าง <input checked="" type="checkbox"/> Training for process and method of construction structure removal and demolishing <input checked="" type="checkbox"/> การใช้อุปกรณ์ป้องกันอันตรายส่วนบุคคลสำหรับงานก่อสร้าง <input checked="" type="checkbox"/> Personal Protection Equipment for Construction work
<b>(๕) การทำงานเกี่ยวกับเครื่องจักร ปั่นจั่น และหม้อน้ำ</b> <b>(5) Machines, Cranes and Boilers</b>
<input checked="" type="checkbox"/> การทำงานเกี่ยวกับเครื่องปั๊มโลหะ เครื่องเชื่อมไฟฟ้า เครื่องเชื่อมก๊าซ รถยก หรือเครื่องจักรที่อาจก่อให้เกิดอันตรายได้โดยสภาพ <input checked="" type="checkbox"/> Metal Stamping Machine, Electric Welding Machine Gas Welding Machine, Forklift or machine which may cause danger <input type="checkbox"/> อบรมผู้ขับรถยก <input type="checkbox"/> Forklift driver training <input checked="" type="checkbox"/> ผู้บังคับปั้นจั่น ผู้ให้สัญญาณแก่ผู้บังคับปั้นจั่น ผู้ยึดเกาะวัสดุ หรือผู้ควบคุมการใช้ปั้นจั่น <input checked="" type="checkbox"/> Crane or derrick operators, the signal givers to the crane or derrick operators, the material holders or the crane or derrick operating supervisors <input type="checkbox"/> ผู้ควบคุมประจำหม้อน้ำ หรือหม้อต้มที่ใช้ของเหลวเป็นสื่อนำความร้อน <input type="checkbox"/> Boiler controller or boilers that use liquid as heat medium
<b>(๖) การทำงานเกี่ยวกับไฟฟ้า</b> <b>(6) Electricity</b>
<input checked="" type="checkbox"/> ความปลอดภัยในการทำงานเกี่ยวกับไฟฟ้าสำหรับลูกจ้างซึ่งปฏิบัติงานเกี่ยวกับไฟฟ้า <input checked="" type="checkbox"/> Safety Electricity work for employees who work on electricity.
<b>(๗) การทำงานเกี่ยวกับสารเคมีอันตราย</b> <b>(7) Hazardous Chemical</b>
<input checked="" type="checkbox"/> ความปลอดภัยเกี่ยวกับสารเคมี <input checked="" type="checkbox"/> Chemical safety <input type="checkbox"/> วิธีการแก้ไขปัญหาเมื่อเกิดเหตุฉุกเฉินขณะขนถ่าย เคลื่อนย้าย หรือขนส่งสารเคมีอันตราย <input type="checkbox"/> Methods of solving problems in an emergency while transferring, moving or transporting hazardous chemicals <input checked="" type="checkbox"/> การควบคุมและระงับเหตุอันตรายกรณีเกิดเหตุฉุกเฉินเกี่ยวกับสารเคมีอันตราย <input checked="" type="checkbox"/> Control and suppress hazards in the event of an emergency regarding dangerous chemicals. <input checked="" type="checkbox"/> ความปลอดภัยในการทำงานสำหรับผู้ปฏิบัติงานในสถานที่เก็บรักษาสารเคมีและวัตถุอันตราย <input checked="" type="checkbox"/> Safety at work for workers in the storage of chemicals and hazardous substances.
<b>(๘) การป้องกันและระงับอัคคีภัย</b> <b>(8) Prevention And Extinguishment of Fire</b>
<input checked="" type="checkbox"/> การดับเพลิงขั้นต้น <input checked="" type="checkbox"/> Basic fire fighting

(๙) อื่น ๆ
(9) Others
<input type="checkbox"/> (ระบุ) ..... <input type="checkbox"/> (specify).....
<b>๔.๒ การตรวจสุขภาพตามปัจจัยเสี่ยง</b> <b>4.2 Health Checkup for Risk factor related work</b>
<input checked="" type="checkbox"/> ตรวจสมรรถภาพปอด <input checked="" type="checkbox"/> Lung capacity checkup <input checked="" type="checkbox"/> ตรวจสมรรถภาพการได้ยิน <input checked="" type="checkbox"/> Hearing capacity checkup <input checked="" type="checkbox"/> ตรวจสมรรถภาพการมองเห็น <input checked="" type="checkbox"/> Seeing capacity checkup <input checked="" type="checkbox"/> ตรวจด้านพิษวิทยา <input checked="" type="checkbox"/> Toxicology examination <input type="checkbox"/> อื่น ๆ (ระบุ) ..... <input type="checkbox"/> Others (specify).....
<b>๔.๓ การตรวจสอบ ทดสอบ สอบเทียบ และใบรับรองเครื่องมือ เครื่องจักร อุปกรณ์</b> <b>4.3 Inspection, testing, calibration and certificates of tools, machines, and equipment</b>
<input checked="" type="checkbox"/> รายการเครื่องมือ เครื่องจักร อุปกรณ์ บันจัน เครื่องตอกเสาเข็ม เครื่องจักรและอุปกรณ์ที่ใช้ในการทำงานก่อสร้างตามที่กฎหมายกำหนด <input checked="" type="checkbox"/> List of tools, machines, and equipment /cranes, pile drivers, machines and equipment used in the construction work as required by law
<b>๔.๔ ประวัติข้อมูลความสูญเสียและสถิติอุบัติเหตุในอดีต (ถ้ามี)</b> <b>4.4 Loss history and accident statistics (if available)</b>
<input checked="" type="checkbox"/> ข้อมูลการบาดเจ็บ การเสียชีวิต สูญเสียอวัยวะ ทุพพลภาพถาวร บาดเจ็บมีผลทำให้เป็นอัมพาต <input checked="" type="checkbox"/> Injury information, death, dismemberment, permanent disability, trauma, resulting in paralysis <input checked="" type="checkbox"/> ข้อมูลสถิติอุบัติเหตุ (IFR, ISR, DII) <input checked="" type="checkbox"/> Accident statistics (IFR, ISR, DII)
<b>๔.๕ ความสามารถในการปฏิบัติตามมาตรฐาน กฎหมายด้านความปลอดภัย (ถ้ามี)</b> <b>4.5 Ability to comply with standards Safety Laws (if available)</b>
<input type="checkbox"/> ใบรับรองระบบการจัดการความปลอดภัย <input type="checkbox"/> Certificate of Occupational Safety, Health and Environment System <input type="checkbox"/> รางวัลด้านความปลอดภัย <input type="checkbox"/> Safety Awards <input type="checkbox"/> อื่น ๆ ..... <input type="checkbox"/> Others .....



บัญชี ๔ ข้อมูลการดำเนินงานด้านความปลอดภัยของผู้รับจ้างที่ต้องจัดส่งก่อนเริ่มปฏิบัติงานตามสัญญาจ้าง

Table 2 Contractor's Safety Information

หน่วยงานผู้ว่าจ้าง : Project Owner :			
งานที่ว่าจ้าง : Project/Contract Name :		บริษัทผู้รับจ้าง : Contractor Name :	
๑. โครงสร้างการบริหารจัดการ บุคลากร และหน้าที่ ความรับผิดชอบด้านความปลอดภัย Structure of management, personnel, roles and responsibilities in Safety			
บุคลากร personnel	รายชื่อ Name	หน้าที่ ความรับผิดชอบ Roles Responsibilities	หลักฐาน/ ใบรับรอง Documents/ Certificates
<input type="checkbox"/> คณะกรรมการความปลอดภัย อาชีวอนามัยและ สภาพแวดล้อมในการทำงาน ..... คน Occupational Safety, Health and Environment Committee			
<input type="checkbox"/> หน่วยงานความปลอดภัย..... คน Safety Department			
<input type="checkbox"/> เจ้าหน้าที่ความปลอดภัยระดับบริหาร..... คน Safety Officer in Management Level			
<input type="checkbox"/> เจ้าหน้าที่ความปลอดภัยระดับหัวหน้างาน..... คน Safety Officer in Supervising Level			
<input type="checkbox"/> เจ้าหน้าที่ความปลอดภัยระดับวิชาชีพ..... คน Safety Officer in Professional Level			
<input type="checkbox"/> เจ้าหน้าที่ความปลอดภัยระดับเทคนิคขั้นสูง.....คน Safety Officer in Advanced Technical Level			
<input type="checkbox"/> เจ้าหน้าที่ความปลอดภัยระดับเทคนิค..... คน Safety Officer in Technical Level			
<input type="checkbox"/> ผู้บริหาร/ผู้จัดการ..... คน Manager			

<input type="checkbox"/> หัวหน้างาน..... คน Supervisor			
<input type="checkbox"/> ลูกจ้าง..... คน Employee			
<input type="checkbox"/> อื่น ๆ (ระบุ) .....			
Others (specify)			
<b>๒. หลักสูตร เอกสารแสดงการผ่านการฝึกอบรม และใบอนุญาต ตามที่กฎหมายกำหนด</b> <b>Courses and documents showing training and licenses as required by law</b>			
<b>๒.๑ หลักสูตรอบรมพื้นฐาน</b> <b>Basic Courses</b>	<b>รายชื่อ</b> <b>Name</b>	<b>หลักฐาน/ใบรับรอง</b> <b>Documents/</b> <b>Certificates</b>	
(๑) ความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานสำหรับลูกจ้างทั่วไปและลูกจ้างเข้าทำงานใหม่ Occupational safety, health and environment for general workers / employees and newly-recruited workers / employees			
(๒) การดับเพลิงขั้นต้น Basic fire fighting			
<b>๒.๒ หลักสูตรอบรมเฉพาะตามความเสี่ยง</b> <b>Specific Courses for Risk factor related work</b>	<b>รายชื่อ</b> <b>Name</b>	<b>หลักฐาน/ใบรับรอง</b> <b>Documents/</b> <b>Certificates</b>	
<input type="checkbox"/> การทำงานในที่อับอากาศ Work in Confined Spaces			
<input type="checkbox"/> การทำงานเกี่ยวกับรังสี Radiation Work			
<input type="checkbox"/> การทำงานเกี่ยวกับงานก่อสร้าง Construction Work			
<input type="checkbox"/> การทำงานเกี่ยวกับเครื่องจักร บันจัน และหม้อน้ำ Machines, Cranes and Boilers			
<input type="checkbox"/> การทำงานเกี่ยวกับไฟฟ้า Electricity			

<input type="checkbox"/> การทำงานเกี่ยวกับสารเคมีอันตราย Hazardous Chemical						
<input type="checkbox"/> อื่น ๆ (ระบุ) ..... Others (specify)						
<b>๓. การตรวจสุขภาพตามปัจจัยเสี่ยง</b> <b>Health Checkup for Risk factor related work</b>						
ลักษณะงาน Job description	แหล่งอันตราย Hazards	การตรวจสุขภาพตามปัจจัยเสี่ยงของงาน Health Checkup for Risk factor related work				ผลการตรวจสุขภาพ/ใบรับรองแพทย์ Health Checkup report/Medical Certificate
		ตรวจสมรรถภาพปอด Lung capacity checkup	ตรวจสมรรถภาพการได้ยิน Hearing capacity checkup	ตรวจสมรรถภาพการมองเห็น Seeing capacity checkup	ตรวจด้านพิษวิทยา Toxicology examination	
<b>๔. การตรวจสอบ ทดสอบ สอบเทียบ และใบรับรองเครื่องมือ เครื่องจักร อุปกรณ์</b> <b>Inspection, testing, calibration and certificates of tools, machines, and equipment</b>						
รายการเครื่องมือ เครื่องจักร อุปกรณ์ List of tools, machines, and equipment		หลักฐาน/ใบรับรอง Documents/ Certificates			วันหมดอายุ Expiration date	
<b>๕. ประวัติข้อมูลความสูญเสียและสถิติอุบัติเหตุในอดีต (ถ้ามี)</b> <b>Loss history and accident statistics (if available)</b>						
<input type="checkbox"/> ข้อมูลการบาดเจ็บ การเสียชีวิต สูญเสียอวัยวะ ทุพพลภาพถาวร บาดเจ็บมีผลทำให้เป็นอัมพาต Injury information, death, dismemberment, permanent disability, trauma, resulting in paralysis		..... .....				
<input type="checkbox"/> ข้อมูลสถิติอุบัติเหตุ (IFR, ISR, DII) Accident statistics (IFR, ISR, DII)		.....				

๖. ความสามารถในการปฏิบัติตามมาตรฐาน กฎหมายด้านความปลอดภัย (ถ้ามี)	
Ability to comply with standards Safety Laws (if available)	
<input type="checkbox"/> ใบรับรองระบบการจัดการความปลอดภัย Certificate of Occupational Safety, Health and Environment System	.....
<input type="checkbox"/> รางวัลด้านความปลอดภัย Safety Awards	.....
<input type="checkbox"/> อื่น Others	.....

บัญชี ๕ แบบประเมินผลการดำเนินงานด้านความปลอดภัยของผู้รับจ้าง

Table 3 Contractor Safety Evaluation Checklist

หน่วยงานผู้ว่าจ้าง : .....		ผู้ประเมิน : ..... วันที่ประเมิน : .....		
The project owner :		Checked by : ..... Date : .....		
งานที่ว่าจ้าง : .....		บริษัทผู้รับจ้าง : ..... สัญญาเลขที่ : .....		
Project/Contract Name :		Contractor Name : ..... Project/Contract No. ....		
<b>กลุ่มงานของผู้รับจ้าง</b> Contractor Category	<input type="radio"/> กลุ่มที่ ๑ กลุ่มงานที่มีความเสี่ยงต่ำ (Low Risk Contracts) <input type="radio"/> Group 1 Low Risk Contract <input type="radio"/> กลุ่มที่ ๒ กลุ่มงานที่มีความเสี่ยงปานกลาง (Medium Risk Contracts) <input type="radio"/> Group 2 Medium Risk Contract <input type="radio"/> กลุ่มที่ ๓ กลุ่มงานที่มีความเสี่ยงสูง (High Risk Contracts) <input type="radio"/> Group 3 High Risk Contract			
หัวข้อประเมิน Topics	น้ำหนัก Weighting	เกณฑ์พิจารณา Criteria	คะแนนเต็ม X น้ำหนัก Score	คะแนนที่ได้ X น้ำหนัก Weighted Score
๑. หลักฐาน/ใบรับรอง การตรวจสอบ ทดสอบ สอบเทียบ เครื่องมือ เครื่องจักร อุปกรณ์ Inspection, testing, calibration and certificates of tools, machines, and equipment	๑๐ 10	๔ คะแนน = ดีกว่าเกณฑ์ที่กำหนด (ก่อนระยะเวลาที่กำหนด และถูกต้อง ครบถ้วน) 4 = Very good (Early than scheduled, correct and complete information) ๓ คะแนน = เป็นไปตามเกณฑ์ที่กำหนด (ตามระยะเวลาที่กำหนด และถูกต้อง ครบถ้วน) 3 = Good (According to scheduled, correct and complete information) ๒ คะแนน = ไม่เป็นไปตามเกณฑ์ แต่ไม่เกิดผลกระทบ (ตามระยะเวลาที่กำหนด แต่ไม่ถูกต้องหรือไม่ครบถ้วน) 2 = Fair (According to scheduled and incorrect or incomplete information) ๑ คะแนน = ไม่เป็นไปตามเกณฑ์ และเกิดผลกระทบ (หลังระยะเวลาที่กำหนด และไม่ถูกต้องหรือไม่ครบถ้วน) 1 = Poor (Later than scheduled and incorrect or incomplete information) N/A = ไม่เกี่ยวข้อง N/A = Not Applicable		

<p>๒. หลักฐาน/ใบรับรอง การฝึกอบรม ใบอนุญาต และผล การตรวจสอบสภาพ ตามที่กฎหมาย กำหนด Courses and documents showing training and licenses as required by law and health checkup report</p>	<p>๑๐ 10</p>	<p>๔ คะแนน = ดีกว่าเกณฑ์ที่กำหนด (ก่อนระยะเวลาที่กำหนด และถูกต้อง ครบถ้วน) 4 = Very good (Early than scheduled, correct and complete information) ๓ คะแนน = เป็นไปตามเกณฑ์ที่กำหนด (ตามระยะเวลาที่กำหนด และถูกต้อง ครบถ้วน) 3 = Good (According to scheduled, correct and complete information) ๒ คะแนน = ไม่เป็นไปตามเกณฑ์ แต่ไม่เกิดผลกระทบ (ตามระยะเวลาที่กำหนด แต่ไม่ถูกต้องหรือไม่ครบถ้วน) 2 = Fair (According to scheduled and incorrect or incomplete information) ๑ คะแนน = ไม่เป็นไปตามเกณฑ์ และเกิดผลกระทบ (หลังระยะเวลาที่กำหนด และไม่ถูกต้องหรือไม่ครบถ้วน) 1 = Poor (Later than scheduled and incorrect or incomplete information) N/A = ไม่เกี่ยวข้อง N/A = not applicable</p>		
<p>๓. การปฏิบัติตาม แผนงานความ ปลอดภัย Follow with safety plan</p>	<p>๒๕ 25</p>	<p>๔ คะแนน = ดีกว่าเกณฑ์ที่กำหนด (ทำได้เร็วกว่าแผน กิจกรรมครบถ้วน บรรลุเป้าหมาย) 4 = Very good (Early than safety plan, complete and achieve safety goal) ๓ คะแนน = เป็นไปตามเกณฑ์ที่กำหนด (เป็นไปตามแผน กิจกรรมครบถ้วน บรรลุเป้าหมาย) 3 = Good (According to safety plan, complete and achieve safety goal) ๒ คะแนน = ไม่เป็นไปตามเกณฑ์ แต่ไม่เกิดผลกระทบ (ช้ากว่าแผน กิจกรรมครบถ้วน บรรลุเป้าหมาย) 2 = Fair (Later than scheduled, complete and achieve safety goal)</p>		

		๑ คะแนน = ไม่เป็นไปตามเกณฑ์ และเกิดผลกระทบ (ช้ากว่าแผน กิจกรรมไม่ครบถ้วน ไม่บรรลุเป้าหมาย) 1 = Poor (Later than scheduled and incomplete and not achieve safety goal)		
หัวข้อประเมิน	น้ำหนัก	เกณฑ์พิจารณา	คะแนนเต็ม X น้ำหนัก	คะแนนที่ได้ X น้ำหนัก
๔. สวมใส่อุปกรณ์ อุปกรณ์คุ้มครองความ ปลอดภัยส่วนบุคคล (PPE) ระหว่าง ปฏิบัติงาน Wearing PPE at work	๑๕ 15	๔ คะแนน = สวมใส่ครบถ้วนตลอดเวลาทำงาน และ เหมาะสมกับลักษณะงานต่อรอบการประเมิน 4 = Wearing suitable PPE at work ๓ คะแนน = มีการแจ้ง พบเห็นไม่สวมใส่ PPE หรือไม่ เหมาะสมกับลักษณะงาน ไม่เกิน ๓ ครั้งต่อรอบการ ประเมิน 3 = Not wearing PPE or Wearing inappropriate PPE less than 3 times ๒ คะแนน = มีการแจ้ง หรือพบเห็นไม่สวมใส่ PPE หรือไม่เหมาะสมกับลักษณะงาน มากกว่า ๓ ครั้งแต่ไม่ เกิน ๕ ครั้งต่อรอบการประเมิน 2 = Not wearing PPE or Wearing inappropriate PPE for 3-5 times ๑ คะแนน = มีการแจ้ง หรือพบเห็นไม่สวมใส่ PPE หรือไม่เหมาะสมกับลักษณะงาน มากกว่า ๕ ครั้งขึ้นไป ต่อรอบการประเมิน 1 = Not wearing PPE or Wearing inappropriate PPE more than 5 times N/A = ไม่เกี่ยวข้อง N/A = Not Applicable		
๕. การปฏิบัติตาม ข้อกำหนดกฎหมาย/ ระเบียบ กฎความ ปลอดภัยของ หน่วยงาน Comply with required by safety law / safety regulations /safety rules	๒๐ 20	๔ คะแนน = ปฏิบัติตามข้อกำหนดกฎหมาย/ระเบียบ กฎความปลอดภัยของหน่วยงานโดยไม่มีการฝ่าฝืนต่อ รอบการประเมิน 4 = Never break safety law / safety regulations /safety rules ๓ คะแนน = ละเมิด/ฝ่าฝืนระเบียบ กฎความปลอดภัย ของหน่วยงาน ไม่เกิน ๓ ครั้งต่อรอบการประเมิน 3 = Break safety regulations /safety rules for 3 times ๒ คะแนน = ละเมิด/ฝ่าฝืนระเบียบ กฎความปลอดภัย ของหน่วยงาน มากกว่า ๓ ครั้งขึ้นไปต่อรอบการประเมิน 2 = Break safety regulations /safety rules more than 3 times		

		๑ คะแนน = ฝ่าฝืนข้อกำหนดกฎหมายต่อรอบการ ประเมิน 1 = Break safety law		
๖.ขณะปฏิบัติงานมี อุบัติเหตุเกิดขึ้น Accident was occured between work	๒๐ 20	๔ คะแนน = ไม่มีอุบัติเหตุเกิดขึ้น 4 = No accident ๓ คะแนน = เกิดอุบัติเหตุระดับความรุนแรงน้อย (Class C) (ปฐมพยาบาล หรือไม่หยุดงาน) (ทรัพย์สินเสียหายไม่ถึง ๑๐๐,๐๐๐ บาท) 3 = Class C accident (first aid or not absence) (Damaged property < 100,000 baht) ๒ คะแนน = เกิดอุบัติเหตุระดับความรุนแรงปานกลาง (Class B) (บาดเจ็บหรือเจ็บป่วยหยุดงาน ตั้งแต่ ๑ วันขึ้นไป) (ทรัพย์สินเสียหายตั้งแต่ ๑๐๐,๐๐๐ บาท ขึ้นไป แต่ไม่ถึง ๕๐๐,๐๐๐ บาท ) 2 = Class B accident (Injury, illness, absence 1 day or more) (Damaged property 100,000 - 499,999 baht) ๑ คะแนน = เกิดอุบัติเหตุระดับความรุนแรงมาก (Class A) (เสียชีวิต, สูญเสียอวัยวะ, ทุพพลภาพถาวร, บาดเจ็บมี ผลทำให้เป็นอัมพาต) (ทรัพย์สินเสียหายตั้งแต่ ๕๐๐,๐๐๐ บาท ขึ้นไป) 1 = Class A accident (Death, dismemberment, permanent disability, trauma resulting in paralysis) (Damaged property > 500,000 baht)		
รวม Total	๑๐๐ 100			
คะแนนสมรรถนะ ด้านความปลอดภัย Performance safety score		$\frac{\sum(\text{คะแนนที่ได้} \times \text{น้ำหนัก})}{\sum(\text{คะแนนเต็ม} \times \text{น้ำหนัก})} \times 100$	= _____ %	

หมายเหตุ : ๑. กรณีผลคะแนนสมรรถนะด้านความปลอดภัยของผู้รับจ้างมีค่าคะแนนตั้งแต่ร้อยละ ๗๕ ขึ้นไป ให้เก็บผลการประเมิน  
ของแต่ละงานไว้ที่หน่วยงานผู้ว่าจ้าง

- Note :
1. In case of performance safety score 75% or more, Project owner shall keep performance safety score at Project owner.
  ๒. กรณีผลคะแนนสมรรถนะด้านความปลอดภัยของผู้รับจ้างมีค่าคะแนนไม่ถึงร้อยละ ๗๕ ให้หน่วยงานส่งผลการประเมินให้ฝ่ายจัดซื้อ  
จัดจ้างและบริหารพัสดุในสำนักงานใหญ่ หรือหน่วยงานจัดซื้อจัดจ้างในส่วนภูมิภาคและเก็บสำเนาผลการประเมินไว้ที่หน่วยงานผู้ว่าจ้าง
  2. In case of performance safety score less than 75%, Project owner shall report to Procurement and Inventory Management Division and keep the copy of performance safety score at Project owner.



**SECTION H**  
**ATTACHMENTS**

## **SECTION H**

### **ATTACHMENTS**

- Attachment No. 1 : List of Equipment to be Furnished by EGAT
- Attachment No. 2 : List of Equipment to be Dismantled by the Contractor
- Attachment No. 3 : Requirements for Dismantling Work and Conditions of Sale of Dismantled Equipment

## **ATTACHMENT NO. 1**

### **LIST OF EQUIPMENT TO BE FURNISHED BY EGAT**

The Equipment listed herein shall be furnished by EGAT in Bangkok and/or its vicinity, at the point to be designated by EGAT as soon as possible after confirmation of Letter of Award of Contract. Any Equipment not listed herein but required for construction for completion of the Work shall be furnished by the Contractor at his own expenses.

<b><u>Item</u></b>	<b><u>Description</u></b>	<b><u>Estimated Quantity</u></b>
1.	1272 MCM ACSR/GA Conductor as per Schedule 1E Item 1E1.1	1,550.40 km
2.	1272 MCM ACSR/GA Conductor as per Schedule 2E Item 2E1.1	74.40 km
3.	795 kcmil ACSR/GA (CONDOR) as per Schedule 3E Item 3E1.1	12.60 km

- Note :**
1. The estimated quantity of conductor shown above is an approximate amount. The actual quantity of conductor to be furnished by EGAT will be in accordance with the actual horizontal distance of the section to be installed after checking survey and staking have been performed, Plus a Fixed extra of 1.5 percent to cover sag, terrain irregularities and wastage.
  2. The conductor furnished will have characteristics as specified in Specifications No. L-500 kV (Revision 1) Construction of 500 kV Transmission Line, April 2001.

## ATTACHMENT NO. 2

### LIST OF EQUIPMENT TO BE DISMANTLED BY THE CONTRACTOR

The following are the Equipment to be dismantled under this Contract. Types and quantities shown are approximate and provided as primary information. The Bidder shall be deemed to have carefully examined the exact quantities for his quotation of dismantling services.

<u>Item</u>	<u>Description</u>	<u>Estimated Quantity</u>
<b>Part 1 :</b>	<b><u>The existing 500 kV Mae Moh 3 – Tha Tako Transmission Line (Circuit 2 and 3)</u></b> (The dismantled Equipment as listed below shall be purchased by the Contractor)	
<b>1.1</b>	<b>Steel Tower</b> Tower Type DH(15) Basic Body Leg extension +10.5 m.	1 body 4 legs
<b>1.2</b>	<b>Hardware Assemblies</b> V-string suspension insulator assemblies (9A)(20) Shield wire suspension assemblies (Insulated) (1)	6 sets 1 set
<b>1.3</b>	<b>Insulator</b> Insulator ANSI Class 52-8 (36,000 lbs)	624 discs
<b>1.4</b>	<b>795 MCM ACSR/GA (CONDOR)</b>	19.49 km
<b>1.5</b>	<b>3/8 ” extra high strength galvanized steel overhead ground wire</b>	1.60 km
<b>1.6</b>	<b>Composite overhead ground wire with 36-core optical fiber</b>	0.80 km

### **ATTACHMENT NO. 3**

#### **REQUIREMENTS FOR DISMANTLING WORK AND** **CONDITIONS OF SALE OF DISMANTLED EQUIPMENT**

The requirements for Dismantling Work and Conditions of Sale of Dismantled Equipment shall apply to this Invitation to Bid.

##### **1. Scope of Dismantling Work**

The scope of dismantling work shall be as listed in the Price Schedule, which covers the provisions of dismantling and a portion of dismantled Equipment returned to EGAT and dismantling with conditions for the Contractor to purchase the dismantled Equipment, as the case may be, and shall be in accordance with Specifications No. TL-07 (Rev. 3) Dismantling Work.

##### **2. Responsibility of Contractor**

The Contractor shall be deemed to have carefully inspected and examined all of the conditions and circumstances of the Equipment as appearing in the existing transmission line to be dismantled under this Contract. EGAT will not be responsible for any defect, imperfection or fault of such Equipment.

For dismantled Equipment to be purchased by the Contractor, the Contractor shall, not later than fifteen (15) Days before the day of de-energizing for the dismantling work, pay the value added tax collectible on the payment for the dismantled Equipment to be sold to the Contractor to EGAT. Upon payment of the value added tax by the Contractor to EGAT, EGAT will issue a tax invoice to the Contractor. Ownership of the Equipment to be dismantled shall be transferred to the Contractor when the transmission line is de-energized for the dismantling work.

In the event that the Contractor shall return a portion of the dismantled Equipment to EGAT, the ownership of the dismantled Equipment is the property of EGAT, but this shall not be construed as relieving the Contractor from the sole responsibility as provided under this Contract for the care, protection, and maintenance of the Equipment. The Contractor shall be responsible for any loss or damages of the Equipment until acceptance has been made by EGAT. The submission of the dismantled Equipment to EGAT shall be performed upon completion of each dismantling portion as scheduled.

### **3. Payment**

Ninety (90) per cent of the amount and the adjusted amount due, if any, for the dismantling work will be paid by EGAT to the Contractor after the date of completion of the dismantling work and in case of the returned dismantled Equipment to EGAT after the dismantled Equipment has been delivered at the site(s) specified and acceptance has been made by EGAT.

In case the scope of the Contract requires the Contractor to purchase any item of dismantled Equipment, payment for cost of dismantled Equipment shall be made by the Contractor as scheduled in the Contract Documents regardless of the actual dismantling to be incurred. In case no schedule is set forth, payment shall be made as soon as possible but not later than two (2) Months after completion of each portion of dismantling work. In case no payment is made within the aforementioned period, EGAT reserves the right to claim directly from the Contractor or from the Performance Security or the Maintenance Security, as the case may be, or deduct or set off from any and all money due to the Contractor under this Contract for the amount together with interest at the rate of Minimum Overdraft Rate (MOR) plus two (2) per cent calculated from the due date up to the date the payment is made in full.