

THE DETAILED DESIGN STUDY ON AREA TRAFFIC CONTROL PROJECT IN BANGKOK IN THE KINGDOM OF THAILAND. SUPPLEMENTARY VOLUME PART 2 DRAFT TENDER AND CONTRACT DOCUMENTS (FINAL)

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**THE DETAILED DESIGN STUDY ON
AREA TRAFFIC CONTROL PROJECT IN BANGKOK
IN THE KINGDOM OF THAILAND**

SUPPLEMENTARY VOLUME

PART 2

DRAFT TENDER AND CONTRACT DOCUMENTS

FINAL REPORT

OCTOBER 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

国際協力事業団

22688

**THE KINGDOM OF THAILAND
BANGKOK METROPOLITAN ADMINISTRATION**

**INVITATION TO TENDER
FOR
BANGKOK AREA TRAFFIC CONTROL SYSTEM PROJECT-STAGE I
AND ASSOCIATED WORKS**

September 1990

(Draft)

JAPAN INTERNATIONAL COOPERATION AGENCY

INVITATION TO TENDER

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THE KINGDOM OF THAILAND
BANGKOK METROPOLITAN ADMINISTRATION

INVITATION TO TENDER

SEALED TENDERS, in triplicate, on forms furnished by the Bangkok Metropolitan Administration (BMA), for Bangkok Area Traffic Control System Project - Stage I and Associated Works, will be received from prequalified tenderers until 10.00 a.m., on the 17th day of December 1990 at the office of the Director, Traffic Engineering Division, Bangkok Metropolitan Administration.

The Work involves mainly the supply and installation of a centrally controlled and synchronized signal system, covering 143 intersection and pedestrian crossing signals, and a closed circuit television system. A project description and a summary of the scope of work are given in Appendix 1 of this "INVITATION TO TENDER". The entire work is to be awarded to a single Contractor under a combined lump sum and unit price contract.

Tender Documents comprising of the Instructions to Tenderers, Conditions of Contract, Specifications, Drawings and Tender Forms are available for issuance from 1st of October, 1990, at:

Traffic Engineering Division,
Bangkok Metropolitan Administration,
Dinso Road,
Bangkok 10200, Thailand.

to prequalified tenderers upon payment of a non-refundable fee of fifteen thousand six hundred (15,600) Baht per set.

A pre-tender conference will be held at the above address at 10.00 a.m. on 1st of October, 1990. Tenderers may make any enquiry at the pre-tender conference or in writing within 30 days starting from the date of issuance of the Tender Documents.

Prior to receiving the Tender Documents, perspective tenderers will be required to designate in writing an authorized representative and an address to which notices may be delivered or sent.

The BMA reserves the right to reject any or all tenders and to waive any required formality in the tenders received.

Any correspondence must be in writing and addressed to The Director, at the above address.

.....
Boonyawat Tiptus
Director
Traffic Engineering Division
Bangkok Metropolitan Administration

APPENDIX 1

Note: This Brief Project Description and Scope of Work summary contain general information intend to give an overall view of the Project and have no contractual significance.

BRIEF PROJECT DESCRIPTION

The Bangkok Metropolitan Administration (BMA) will implement an Area Traffic Control (ATC) System in Bangkok based on the findings and recommendations of a Feasibility Study on Area Traffic Control System in Bangkok completed in 1989.

The present Bangkok ATC System which was installed in 1979 has a capacity of controlling 64 intersections. Presently, this coordinated system controls only 47 intersections in the old part of the City. The traffic control center of this system is located at the Office of Planning and Policy, Ministry of Interior.

The Bangkok ATC System Project - Stage I will provide the BMA with a traffic control system controlling a total of 143 signals within an area that can be defined as east of the Chao Phraya River, and bounded by Ratchawithi Road to the north, Soi Asok to the east and Sathon Road to the south. This system shall encompass the 47 intersections presently controlled by the existing coordinated system, 80 other intersections presently under isolated control, 3 existing pedestrian crossing signals, and 16 intersections to be installed with new traffic signals. The stage I project will replace all the 130 local controllers and modify some of the existing signal display equipment.

The Stage I Project will include traffic surveillance functions using Closed Circuit Television (CCTV) cameras to be installed at five key intersections and vehicle detectors. For the transmission system, the Stage I Project will utilize leased cables owned by the Telephone Organization of Thailand (TOT). The traffic control center for the ATC System is to be located at the Traffic Engineering Division at the BMA Building 1 at Dinso Road.

SCOPE OF WORK SUMMARY

Work for the Bangkok Area Traffic Control System Project -Stage I requires the selected Contractor to furnish and install all software and equipment, and do all works necessary to put the system into full and complete operation.

The works to be done by the CONTRACTOR will include furnishing and installing the host computer, and other necessary central equipment at the traffic control center, modifying the building space designated to be the control center in the Traffic Engineering Division Building and carrying out accommodation works for fitting the central equipment as specified, furnishing and installing local controllers, signal heads, handholes, poles and foundations as required, furnishing and installing vehicle detectors both loop coil and ultrasonic types as specified, furnishing and installing CCTV cameras and mounting poles at specified locations, and carrying out signal installation related civil and field works on site as necessary for all the equipment.

The CONTRACTOR will be responsible for the entire scope of work, which shall include the necessary field survey, transportation, furnishing and installation of software and equipment, testing, documentation, commissioning, furnishing operation manuals, training of staff, furnishing of spares, consummables, maintenance equipment, and the maintenance of the entire system within the guarantee period. The CONTRACTOR may be required to provide maintenance services beyond the guarantee period.

**KINGDOM OF THAILAND
BANGKOK METROPOLITAN ADMINISTRATION**

**INVITATION TO TENDER
FOR
BANGKOK AREA TRAFFIC CONTROL SYSTEM PROJECT - STAGE I**

PART A

INSTRUCTIONS TO TENDERER

INVITATION TO TENDER

PART A : INSTRUCTIONS TO TENDERERS

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PART A - INSTRUCTIONS TO TENDERERS

1.0 GENERAL

1.1 TENDER DOCUMENTS

Two copies of this Invitation to Tender and two sets of blue-line prints of the design Drawings are available for purchase to each perspective Tenderer.

1.2 OFFICIAL LANGUAGE AND MEASUREMENTS

English shall be the official language for purposes of this contract. All correspondence, documents, and submittals including specifications, design and instruction manuals, literature, pamphlets, shipping marks, drawings, test data, equipment labels, etc. and all verbal communications shall be in English.

All weights, length, measurements and other units shall be for all purposes of this contract expressed in the metric system, unless specifically call for otherwise.

1.3 DELIVERY OF TENDERS

Each tender must be submitted in triplicates, one original and two copies, in a large sealed envelope clearly marked:

**TENDER FOR
"BANGKOK AREA TRAFFIC CONTROL SYSTEM PROJECT -
STAGE I"**

Date: _____

Submitted by: _____

All tenders must be delivered to the office of the **Director of Traffic Engineering Division, Bangkok Metropolitan Administration, not later than 10.00 a.m., on the 17 day of December, 1990.**

Within the large sealed envelop, the Technical Proposal and the Financial Proposal must be contained in **two separate and sealed envelopes** and clearing marked:

"TECHNICAL PROPOSAL - Bangkok ATC System"

Date: _____ Submitted by: _____

and

"FINANCIAL PROPOSAL - Bangkok ATC System"

Date: _____ Submitted by: _____

The required Tender Deposit shall be contained in another sealed envelop, which shall be marked:

"Tender Deposit - Bangkok ATC System"

Submitted by: _____

1.4 PRE-TENDER CONFERENCE

A pre-tender conference will be held at the Traffic Engineering Division of the Bangkok Metropolitan Administration at Dinso Road, Bangkok at 10.00 a.m. on 1st of October, 1990.

1.5 TENDER OPENING

The Technical Proposals of all Tenders will be opened at 10.00 a.m., on the 17 day of December, 1990 in the office of the Director, Traffic Engineering Division, Bangkok Metropolitan Administration. The Financial Proposals will be opened on a later date to be announced after the Technical Proposals have been evaluated. The financial proposals of those Tenderers whose Technical Proposals have been found to be unacceptable will be returned unopened. All Tenderers or their representatives are invited to attend the openings.

1.6 TENDER SUBMISSION

Each Tenderer is limited to submit only one Tender.

1.7 VALIDITY

In the event of late delivery of a Tender or the omission of any required document, the Tender shall be rejected. Tenders shall be valid for a

period of one hundred and twenty (120) days counting from the day of tender opening or until a contract has been executed, whichever comes first.

1.8 WITHDRAWAL

Tenderers may withdraw or modify their Tenders after submission provided that written notice of the modification or withdrawal is received by the BMA prior to the closing time for the submission of Tenders. In the event of modification, the Tenderer must resubmit the modified volumes of Tender.

1.9 TENDER DEPOSIT

The Tenderer shall submit a Tender Deposit amounting to ten percent (10%) of the Total Tender Price in the form of a check drawn on a Thailand bank to the favor of the Bangkok Metropolitan Administration. Any Tender that is not accompanied with a Tender Deposit will be rejected outright.

The Tender Deposits of all but the three lowest complying tenderers shall be returned upon the written request from the Tenderers. The other deposits shall be returned after a contract agreement has been signed. Deposit of the selected Tenderer however will be held on until the Performance Bond or other satisfactory security has been provided to replace the intent of the Tender Deposit.

2.0 TENDER REQUIREMENTS

2.1 TENDERER'S RESPONSIBILITIES

The Tenderer shall be responsible for having taken steps to carefully examine all of the Tender Documents and also to have fully familiarized himself of all conditions, local or otherwise, affecting the conduct of the contract work, and to have arrived at an estimate of the facilities available and needed for the Works. Failure to do so shall be at the Tenderer's risk.

It shall be the sole responsibility of the Tenderer to determine and to satisfy himself by such means as he considered necessary or desirable as to all matters pertaining to the project, including the location and the nature and condition of the terrain, geological and climatic conditions at the site, transportation and communication facilities, the requirement and the availability of materials, labor, water, electric power and roads, and other factors that may affect the cost, duration, and execution of the work. The Tenderer, by the act of submitting his tender, acknowledges that he has inspected the site and determined the general characteristics of the project and the conditions indicated above.

The BMA shall not assume any responsibility regarding erroneous interpretations or conclusions by the Tenderer out of the data furnished by the BMA.

Prior to submitting his Tender, the Tenderer is required to have become familiar with all laws, decrees, ordinances, acts, and regulations of the Kingdom of Thailand and local governments which may affect or apply to the operations and activities of contractors.

2.2 TENDER SCHEDULES AND SUMMARY

Tenders shall be prepared on the SCHEDULE OF RATES AND PRICES (SCHEDULE) and SUMMARY OF TENDER forms which are included in this document as Annexes of Part B. Each and every space in the SCHEDULE shall have an entry for the appropriate price or rate, or the letters "N.A.", if that space is not applicable. All Tender shall be signed by an authorized principal of the Tenderer's company.

Except spare parts, all equipment items to be furnished shall include suitable cabinets or enclosures unless such cabinets or enclosures are

shown as separate items in the SCHEDULE or are normally not required. All equipment items shall also include mounting hardware, cables, and wiring facilities necessary to complete a fully functional system. Software items shall include operation and application programs and a complete database, except where they are separately itemized, necessary to effect the operations as intended.

All installation items shall include constructing appropriate mounting or attachment facilities, such as footing or foundation pad, and all piping, wiring, and other related works necessary to complete a fully functional system unless such facilities or works are separately itemized.

2.3 DETAILS OF EQUIPMENT

For each major equipment items in the SCHEDULE, the Tenderer shall provide details of the equipment regarding its manufacturer or maker, model number or identification number, number of years in use, and places used by completing the "DETAILS OF EQUIPMENT" form which is provided in the Annexes of Part B.

2.4 ALTERNATIVE TENDER

The Tenderer may propose alternative equipment and submit the corresponding rates and prices in addition to the rates and prices which are shown in the SCHEDULE but they must be shown on separate sheets clearly marked as "PROPOSED RATES AND PRICES FOR ALTERNATIVE EQUIPMENT." Each item in the Alternative Tender shall be accompanied by a detailed explanatory note describing the alternative equipment proposed and indicating the reason(s) for proposing the alternative. The explanatory note shall be included in the proposal sheets immediately following the identification and proposed prices of each item. A sample form for the alternative tender is included in the Annexes of Part B.

2.5 TENDERER'S QUALIFYING CONDITIONS

The Tenderer may submit qualifying conditions or exceptions in the cover letters with their Tenders. Any such conditions or exceptions will not necessarily be binding on the BMA and may result in the rejection of the Tender.

2.6 STATEMENT OF COMPLIANCE

A statement of compliance, which shall be executed on the form provided in Part B of this document, shall accompany each Tender.

If any of the proposed equipment or services will not be in compliance with the Technical Specifications, the Tenderer shall include in a section of his Technical Proposal explanatory notes for such non-compliances. The explanatory notes shall be presented in the same section/sub-section order of the Technical Specifications and shall describe the differences and reason(s) for non-compliance and provide support information to show that the Tenderer's proposed equipment and services will meet the intent of the Specifications and will not in any way reduce or compromise the effectiveness and reliability of the system or affect the maintenance of the system. References may be made to other sections of the Technical Proposal to avoid duplications.

2.7 ERASURES

No authorized erasures or corrections on the SCHEDULE and SUMMARY OF TENDER shall be allowed, except as noted at the opening of tenders and duly counter-signed by an BMA official.

2.8 PAYMENT CURRENCY

All payment make by BMA to the CONTRACTOR shall be in Thai Bahts only. The summary of tender and all schedules shall therefore be quoted in Bahts.

2.9 IMPORT DUTIES AND TAXES

For goods to be imported into Thailand, the Tender prices in the SCHEDULE shall cover all costs, including insurance, transport, handling charges, and customs or import duties.

For domestically supplied goods, the tender prices shall include all applicable taxes.

Besides the customs and import duties, the Tenderer is also responsible for all taxes, fees and duties for which he is liable to the Thailand Government. Payment for the cost of these duties, taxes and fees shall be understood to be included in the tender prices and no separate compensations will be made therefor. However, for purposes of computing price escalation, the Tenderer shall itemize the cost of these on a separate sheet which shall be attached to the SCHEDULE.

2.10 GUARANTEE

The Contractor shall be responsible for correcting all defects uncovered during the guarantee period in accordance with Section 8.0, "GUARANTEES AND GUARANTEE PERIOD MAINTENANCE," of Special Conditions of Contract. The costs of correcting such defects shall be included in the various items of SCHEDULE and no separate compensations will be made therefor.

2.11 EXTENDED MAINTENANCE

The Tenderers shall include in the Tender, the proposed cost of maintenance of the system after the Guarantee Period in accordance with requirements as stipulated in Part H:"MAINTENANCE SPECIFICATIONS", of the Contract Documents. This Maintenance Work is not a part of this Contract, but will be in a separate contract to be signed between BMA and the CONTRACTOR before the expiry of the Guarantee Period if the BMA chooses to exercise the option.

2.12 TECHNICAL PROPOSAL

Tenderers are required to submit their Technical Proposal together with the Tender. The Technical Proposal shall provide detailed information on all goods and services to be furnished by the Tenderer if selected, and the Tenderer's proposed organization, staffing plan, and project management approach. For the post system acceptance maintenance, if the tenderer wishes to propose a system that differs from those specified in the Maintenance Specifications, such proposals should be described in details and included in the Tenderer's Technical Proposal.

3.0 AWARD OF CONTRACT

3.1 TYPE OF CONTRACT

The Contract to be awarded will be a combined lump sum and unit price type, as described and indicated in the Schedules of Rates and Prices.

The Contract shall be awarded as a single contract for the supply, installation and guarantee period maintenance of the stage I Bangkok Area Traffic Control System.

3.2 AVAILABILITY OF FUNDS

The BMA will finance the construction of this Stage I of the Area Traffic Control System. However, should the funds available falls short of the total cost, it may become necessary to negotiate with the selected Tenderer for a modification of material and labor to be provided in order to stay within funds available for the system.

3.3 REJECTION OF TENDERS

The BMA reserves the right to reject any or all Tenders. The BMA assumes no responsibility whatsoever for loses that may have incurred to the Tenderers in the course of preparing this Tender.

4.0 EVALUATION OF TENDERS

4.1 MAIN FACTORS

The main factors which will be taken into account in evaluating and comparing tenders include the following:

- 1) Compliance with the Conditions of this Invitation to Tender and the Specification, including additions or modifications as may be required by the BMA prior to the opening of tenders,
- 2) Total tender price for the Contract evaluated against the reliability and performance of equipment offered and against the extent that guarantees are provided for satisfactory continued support services and facilities in Bangkok.
- 3) Maintenance proposal and its cost for maintaining the system after the Guarantee Period.

4.2 TWO STEPS EVALUATION

Evaluation of tenders shall be carried out in two steps. The technical proposals shall be opened first for an evaluation of such technical aspects of the proposed system as its compliance to technical specifications and requirements.

The financial proposals of complying tenderers shall then be opened for an evaluation of the costs of their proposed systems. Financial proposals of those who have their technical proposals rejected shall be returned unopened.

**KINGDOM OF THAILAND
BANGKOK METROPOLITAN ADMINISTRATION**

**INVITATION TO TENDER
FOR
BANGKOK AREA TRAFFIC CONTROL SYSTEM PROJECT - STAGE I**

PART B

FORM OF TENDER

PART B: FORM OF TENDER

4. We agree to abide by this Tender for the period of one hundred and twenty (120) calendar days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
5. Unless and until a Formal Agreement is prepared and executed, this Tender, together with your written acceptance thereof, shall constitute a binding Contract between us.
6. We understand that you are not bound to accept the lowest or any tender you may receive.

Dated this _____ day of _____, 19 _____,

Name _____

in the capacity of _____ duly authorized to sign

tender for and on behalf of _____

(IN BLOCK CAPITALS)

at _____

(ADDRESS)

Signature: _____

and Witnessed by: _____

(Name)

Address: _____

Occupation: _____

Signature: _____

ANNEX B-1 : SUMMARY OF TENDER

SYSTEM	BAHT TOTAL
General Requirements	฿ _____
Traffic Signal System	฿ _____
C.C.T.V. System	฿ _____
Control Center	฿ _____
GRAND TOTAL	฿ _____

All payments to be made under this contract, be it progress or otherwise, for all goods, software and equipment inclusive of those manufactured or procured overseas and costs of foreign labor shall be paid by BMA in Thai Bahts according to the Schedules of Rates and Prices. Tenderers shall bear all risks pertaining to fluctuation of exchange rates on items to be secured or supplied with foreign currency and all costs as may be involved in transferring said payments received overseas.

Annex B-1: Summary of Tender

Dated this _____ day of _____, 19_____

Name _____ in the capacity of
_____ duly authorized to sign bid for and on behalf
of _____

(IN BLOCK CAPITALS)

(ADDRESS)

Signature: _____

and Witnessed by _____
(NAME)

Address _____

Occupation _____

Signature: _____

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(1) GENERAL REQUIREMENTS

Item No. (a)	Particular (b)	Unit (c)	Quantity (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
1.1	Mobilization, project management and other expenses: (a) Field Office and Management Staff (b) Other overheads	per month per month	18 18		
1.2	System Design Approval and Briefing	L.S.	1		
1.3	Guarantee Period Maintenance (a) Normal Maintenance - signal (b) Normal Maintenance - ultrasonic detector (c) Normal Maintenance - loopcoil detector (d) Normal Maintenance - CCTV field equipment (e) Normal Maintenance - Traffic Control Center (f) Accident Repair (g) Other Repairs	/signal/month /detector/month /detector/month /camera/month per month L.S. L.S.	1752 852 4644 60		
1.4	Factory Test	L.S.	1		
1.5	Training (a) Two Classroom Trainings (b) On-the-job Training	L.S. L.S.	1 1		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(1) GENERAL REQUIREMENTS					
Item No.	Particular	Unit	Quantity	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
1.6	Documentation (a) System Design Manual (b) Operator's manual (c) Software Manual (d) Hardware Manual (e) Maintenance Manual (f) As-built drawings	set set set set set set	10 10 10 10 10 10		
1.7	Contingency for 2-year Extended Maintenance	Provisional Sum	-		
1.8	Contingency for Additional Spare Parts and maintenance equipment	Provisional Sum	-		
				Total	

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(2) TRAFFIC SIGNAL SYSTEM

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
2.1	Softwares for Central Computers (a) Develop and install application softwares for area wide signal control operations (b) Develop and install application softwares for traffic data gathering and processing (c) Develop and install application softwares for equipment monitoring (d) Develop and install application softwares for man-machine interface (e) Develop and install application softwares for data recording and reporting (f) Furnish and install system softwares (operating system, compiler program, etc.)	L.S	1		
		L.S	1		
		L.S	1		
		L.S	1		
		L.S	1		
		L.S	1		
2.2	Softwares for Local controllers (a) Develop and install application softwares for area wide signal control operations (b) Develop and install application softwares for equipment monitoring	L.S	1		
		L.S	1		
2.3	Softwares for Vehicle Detectors (a) Develop and install application softwares for traffic data gathering and processing	L.S	1		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(2) TRAFFIC SIGNAL SYSTEM

Item No.	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
2.4	Data Base (central and local) (a) Develop and install database for area wide signal control operations (central computer system) (b) Develop and install isolated and fail-safe plans for local controller (c) Develop and install time-of-day timing plans for local controller (d) Develop and install database for traffic data gathering and processing	signal signal signal Detector	158 142 142 458		
2.5	Central Computers (a) Furnish CPU equipment (b) Furnish console CRT & keyboard equipment (c) Furnish console printer equipment (d) Furnish FEP equipment (e) Furnish interface equipment (f) Install hardware system	set set set set L.S L.S	2 2 2 2 1 1		
2.6	Peripherals (a) Furnish system clock equipment (b) Furnish switching unit equipment (c) Furnish system harddisk equipment (d) Furnish data harddisk equipment (e) Furnish floppy disk drive equipment (f) Furnish magnetic tape unit equipment (g) Furnish line printer equipment (h) install hardware system	set set set set set set set L.S	1 1 2 1 2 2 1 1		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(2) TRAFFIC SIGNAL SYSTEM

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
2.7	Work Station (a) Furnish work station equipment (including display/keyboard) (b) Furnish laser printer (c) Furnish serial dot printer (d) Furnish work station furniture (computer room) (e) install hardware system	set set set each L.S	3 1 1 1 1		
2.8	Traffic Condition Monitoring Wallmap (a) Design and install background roadway and topographic features (b) Furnish and install map face tile (c) Furnish and install signal indicator light (d) Furnish and install congestion level indicator light (e) Furnish and install phase 1 green indicator light (f) Furnish Date and Time Display Equipment (g) Furnish input/output controller including lamp test switch (h) Furnish interface equipment (i) install hardware system (i) Furnish and install map structure	L.S. L.S. signal each signal L.S. each L.S. L.S. each	1 1 146 178 146 1 1 1 1 1		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(2) TRAFFIC SIGNAL SYSTEM

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
2.9	Equipment Monitoring Wallmap	L.S.	1		
	(a) Design and install background roadway and topographic features	L.S.	1		
	(b) Furnish and install map face tile	L.S.	142		
	(c) Furnish and install local controller indicator light	L.S.	361		
	(d) Furnish and install detector indicator light	L.S.	1		
	(e) Furnish and install central equipment monitoring panel	L.S.	1		
	(f) Furnish and install project area map panel	L.S.	1		
	(g) Furnish and install date and time display	L.S.	1		
	(h) Furnish input/output controller including lamp test switch	L.S.	1		
	(i) Furnish interface equipment	L.S.	1		
	(j) Install hardware system	L.S.	1		
	(k) Furnish and install map structure	L.S.	1		
2.10	Control Desk	each	1		
	(a) Furnish and install control desk furniture	each	1		
	(b) Furnish and install manual control panel	each	1		
	(c) Furnish and install central equipment monitoring panel and wallmap control switches	each	1		
2.11	Communication Equipment	set	1		
	(a) Furnish communication control unit	set	148		
	(b) Furnish MODEM	set	1		
	(c) Furnish main distribution frame	L.S.	1		
	(d) Furnish interface equipment	L.S.	1		
	(e) Install hardware system	L.S.	1		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(2) TRAFFIC SIGNAL SYSTEM

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
2.12	Furnish Local Controller (a) Local controller (include fully wired cabinet, terminal box, mounting pedestal, telemetry and power units, load switches, relays, etc.) (b) Railroad pre-emption controller unit (c) Pedestrian push button interface unit (d) Solid state relay unit (e) Pre-processor for detector pulse	set	142		
2.13	Install Local Controller and Associated Equipment (complete on site with cabinet, terminal box, mounting pedestal etc. under 2.12 and footing)	each	142		
2.14	Furnish and Install Power Supply Equipment for Intersection (include box, switch, breaker and meter base)	set	16		
2.15	Furnish and Install TOT Line Terminal Equipment for Intersection (include box, switch, breaker and meter base)	set	142		
2.16	Remove Existing Controller	site	133		
2.17	Furnish and Install Pre-emption Switch and Wiring	site	7		
2.18	Furnish Signal Pole (include mast arm, anchor bolts and nuts) and Wiring Terminal (a) Type A pole (high) (b) Type B pole (low) (c) 12 P terminal (d) 20 P terminal	each each each each	235 250 330 170		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(2) TRAFFIC SIGNAL SYSTEM

Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
2.19	Install Signal Pole and Footing (a) Type A pole (high) (b) Type B pole (low)	each each	235 250		
2.20	Furnish Signal Head (include lamps, visors, mounting bracket) (a) 3 aspects (200mm x 3) (b) 3 aspects (200mm x 2, 300mm x 1) (c) 3 aspects (300mm x 3) (d) 4 aspects (200mm x 3, 300mm x 1) (e) 4 aspects (200mm x 2, 300mm x 2) (f) 4 aspects (300mm x 4) (g) 6 aspects (200mm x 4, 300mm x 2) (h) 6 aspects (300mm x 6) (i) Pedestrian	set set set set set set set set set set	130 100 110 90 40 70 40 70 50		
2.21	Furnish Head Arrow Mask for 300mm Lens	each	500		
2.22	Furnish Target Board (a) For 3 aspect (b) For 4 aspect (c) For 6 aspect	each each each	230 130 40		
2.23	Install Signal Head (complete with lamps, visors, target board, and arrow masks as required) (a) 3-aspect assembly on mast arm (b) 3-aspect assembly on pole (c) 4- to 6-aspect assembly on mast arm (d) 4- to 6-aspect assembly on pole (e) Pedestrian	set set set set set	110 230 140 170 50		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(2) TRAFFIC SIGNAL SYSTEM

Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
2.24	Furnish Conduit, with Coupling Joint where necessary for Intersection (a) Steel conduit -- 100mm (b) Steel connecting elbow (c) Steel conduit -- 39mm (d) Steel conduit -- 28mm	meter meter meter meter	10300 630 100 750		
2.25	Install Conduit (any sizes and type, and include trenching and restoration) for intersection (a) Under asphalt pavement (b) Under concrete pavement or sidewalk (c) Under railroad crossing (d) On riser support pole	meter meter meter meter	1350 8850 100 850		
2.26	Furnish and Install Handholes for Intersection (a) Type C (b) Type D	each each	400 150		
2.27	Furnish Local Wiring Cable and Power Cable (a) 6-conductor cable (b) 8-conductor cable (c) 12-conductor cable (d) 20-conductor cable (e) Power Cable	meter meter meter meter meter	3800 2500 4700 6000 1000		
2.28	Furnish Cable Splicing Kit	set	110		
2.29	Install Local Wiring (laying and connect signal cable including power supply cable) (a) Intersection signal (b) Power cable	meter meter	17000 1000		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(2) TRAFFIC SIGNAL SYSTEM

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
2.30	Remove and Salvage Existing Signal (a) Signal pole (include head, footing, etc.) mast arm type (b) Signal pole (include head, footing, etc.) pedestal type (c) Head only (d) Arrow mask (e) Push Button	each each each each each	80 220 15 5 2		
2.31	Furnish TOT Communication Cable for Intersection (CPV, 0.5mm, 1P)	meter	2840		
2.32	Install TOT Communication Cable for Intersection (TOT line box - controller)	meter	2840		
2.33	Furnish and Install Grounding for Intersection (a) Grounding rod and cable	location	142		
2.34	Furnish Detector Equipment (a) Detector cabinet (include TTR unit and power unit) (b) Detector cabinet (include power unit) (c) Pre-processor for detector pulse (d) Loop coil detector unit (e) Loop coil cable (f) Loop coil feeder cable (loop coil to detector unit) (g) Loop coil jointing sheath (h) Loop coil filling material (shobond #303c) (i) Ultrasonic detector unit (j) Ultrasonic detector head (k) Ultrasonic feeder cable (ultrasonic head to detector unit)	set set set set meter meter set set set set meter	6 292 6 387 3100 5300 387 387 71 71 1400		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(2) TRAFFIC SIGNAL SYSTEM

Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
2.35	Furnish and Install Power Supply Equipment for Detector (include box, switch, breaker and meter base)	set	6		
2.36	Furnish and Install TOT Line Terminal Equipment for Detector (include box, switch, breaker and meter base)	set	6		
2.37	Furnish Detector pole (include anchor bolts and nuts)				
	(a) Type A pole	each	79		
	(b) Type B pole	each	185		
	(c) Type C pole with 7.0m arm	each	33		
	(d) Type C pole with 8.5m arm	each	5		
2.38	Furnish Detector Mounting Assembly for Installation on Pedestrian Overpass	each	30		
2.39	Install Detector Equipment				
	(a) Detector cabinet	each	298		
	(b) Loop coil in concrete pavement	loop	387		
	(c) Head for ultrasonic detector	each	71		
	(d) Feeder cable - underground	meter	6700		
	(e) Feeder cable - aerial	meter	20		
	(f) Terminating conduit (loop type) (HIVE 28mm)	meter	387		
2.40	Install Detector Pole and Footing				
	(a) Type A pole	each	79		
	(b) Type B pole	each	185		
	(c) Type C pole with 7.0m arm	each	33		
	(d) Type C pole with 8.5m arm	each	5		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(2) TRAFFIC SIGNAL SYSTEM

Item No.	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
2.41	Furnish Conduit, with Coupling Joint where necessary for Detector (a) Steel conduit -- 100mm (b) Steel connecting elbow (c) Steel conduit -- 39mm (d) Steel conduit -- 28mm	meter	27500		
2.42	Install Conduit (any sizes and type, and include trenching and restoration) for Detector (a) Under asphalt pavement (b) Under concrete pavement or sidewalk (c) On pedestrian overpass (d) On riser support pole	meter	700		
2.43	Furnish and Install Handholes for Detector Type C	meter	26800		
2.44	Furnish Aerial Cable Supporter	meter	530		
2.45	Furnish Detector Cable for Communication and Power Cable (a) 6-conductor cable (CVW) (b) 8-conductor cable (CVW) (c) 12-conductor cable (CVW) (d) 6-conductor cable (CVW-SS) (e) 8-conductor cable (CVW-SS) (f) 12-conductor cable (CVW-SS) (g) Power Cable	each	530		
2.46	Install Local Wiring for Detector (a) Detector cable (underground) (b) Detector cable (aerial) (c) Power cable	each	650		
		meter	27700		
		meter	3500		
		meter	2500		
		meter	13100		
		meter	1600		
		meter	2200		
		meter	250		
		meter	33700		
		meter	16900		
		meter	250		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(2) TRAFFIC SIGNAL SYSTEM

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
2.47	Furnish TOT Communication Cable for Detector (CPV, 0.5mm, 1P)	meter	150		
2.48	Install TOT Communication Cable for Detector (TOT line box - cabinet)	meter	150		
2.49	Furnish and Install Grounding for Detector (a) Grounding rod and cable	location	302		
				Total	

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(3) CCTV SYSTEM

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
3.1	Furnish Terminal Equipment (a) Camera with zoom lens (b) Camera pan-tilt head (c) Camera housing (d) Camera controller unit (include control signal receiver water-proof cabinet etc.) (e) Anti-lightning transformer (f) Interface devices including cables	camera each each each each L.S	5 5 5 5 5 1		
3.2	Install Terminal Equipment (a) Camera unit, controller unit and hardware system	each	5		
3.3	Furnish Pole with Ladder, Platform, and Barrier Poles and Pedestal for Controller (a) Camera Pole - Type A (b) Camera Pole - Type B (c) Barrier poles with chain (d) Pedestal pole	each each each each	3 2 30 5		
3.4	Install Pole with Ladder, Platform, and Barrier Poles and Pedestal for Controller (a) Mounting Pole - Type A (b) Mounting Pole - Type B (c) Mounting barrier with chain (d) Mounting pedestal and footing	each each each each	3 2 30 5		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(3) CCTV SYSTEM					
Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
3.5	Furnish and Install TOT Lines, and Power Cable (a) Power supply box and cable (average 20m each) (b) TOT line box and cable (average 20m each) (c) Conduits - 28 sq.mm Steel Pipe - 39 sq.mm Steel Pipe (d) Handhole	site site site site each	5 5 5 5 5		
3.6	Furnish and Install Grounding (a) Grounding rod and cable	each	5		
3.7	Furnish Central Equipment (a) Monitor TV - 21 inch (b) Monitor TV - Structure (c) Monitor TV - 12 inch (d) Operator console panel (e) Video tape recorder (VHS) (f) Superimposer (g) Central CCTV Controller Unit include control signal transmitter switching units etc. (h) Interface devices including MDF and cables (i) Interface devices with other systems	set set set each each each each L.S L.S	5 1 2 1 1 1 1 1 1 1		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(3) CCTV SYSTEM					
Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
3.8	Install Central Equipment (monitor TV, structure, controller unit, operator console panel)	L.S	1		
3.9	Furnish Coders and Decoders (a) Coder and decoder (b) Coaxial cable 10c-FL-SS (c) Aerial cable supporter	each meter each	5 9000 240		
3.10	Install Coders and Decoders (a) Coder and decoder (b) Coaxial cable 10c-FL-SS	each meter	5 9000		
				Total	

ANNEX B-2 : SCHEDULE OF RATES AND PRICES
(4) TRAFFIC CONTROL CENTER AND STORAGE YARD

Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
4.1	<p>CONCRETE WORK FOR GENERATOR ROOM</p> <p>(a) Ordinary concrete Fc=210-240kg/sq.cm (Include mixing, transportation, pouring, trowelling, curing of concrete, construction, isolation, joints, and all other related works)</p> <p>(b) Formwork (Include scaffolding, measuring, fixing and striking of form and all other related works)</p> <p>(c) Floor Concrete Hardner</p> <p>(d) Reinforcement (Include cutting, bending and fixing of reinforcing bars and all other related works)</p>	cu.m	23.40		
		sq.m	234.00		
		cu.m	5.40		
		ton	0.22		
4.2	<p>STRUCTURE STEEL WORKS</p> <p>(Include all works such as cutting, welding, corted, shop Blasteng and primer coating, setting of anchor bolts, erection, bolting and welding, final paint coating and all other related works)</p>				
4.2.1	<p>Steel Framing Structures and Checkered Steel Plates for Floors</p> <p>(Include stiffeners, base plates, diaphragm, and anchor bolts all other related works)</p> <p>(a) Control Desk</p> <p>(b) Broadcasting Room</p>	ton	0.30		
		ton	0.50		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
4.2.2	Stair Case in Living Room (Include steps and hand rails)	unit	1		
4.3	PLASTERING WORKS (Include all sand, cement, plaster, and other materials and related works)				
4.3.1	50mm thick Sand/Cement Plaster For Floor Bed (a) Control Desk (b) Broadcasting Room (c) Stairs in Living Room	sq.m sq.m sq.m	12.50 10.00 0.80		
4.3.2	30mm thick Sand/Cement Plaster For bases in Generator Room	m.	30.00		
4.3.3	Sand/Cement Plaster for patching and repair to existing wall following removal of hardware, existing door at Power Supply Room.	sq.m	2.00		
4.4	INTERIOR FINISHING WORKS				
4.4.1	Access Floor System (Include all materials, constructed panel with PVC tiles, pedestals, vertical adjustment, layout, and all other related works)				
	(a) Control Room	sq.m	116.50		
	(b) Living Room	sq.m	26.00		
	(c) Reception Room	sq.m	26.00		
	(d) Traffic Police Office	sq.m	12.50		
	(e) Eng. I (Head)	sq.m	12.50		
	(f) Eng. II (Asst)	sq.m	12.50		
	(g) Computer Room	sq.m	173.00		
	(h) Software Storage	sq.m	15.00		
	(i) Maintenance & Storage	sq.m	22.50		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
4.4.2	<p>Dry Type Partition Wall (Include all supports, metal frames, chamfering, screws, adhesives, hardware, and all other related works)</p>				
	(1) Single Plaster Board 12mm thickness (system-1)	sq.m	17.50		
	(a) Living Room	sq.m	20.00		
	(b) Traffic Police Office	sq.m	20.00		
	(c) Eng. I (Head)	sq.m	18.00		
	(d) Eng. II (Asst)	sq.m	23.00		
	(e) Software Storage	sq.m	30.00		
	(f) Maintenance & Storage	sq.m			
	(2) Double Plaster Boards 12mm + 12mm thickness (System-2)	sq.m	14.60		
	(a) Broadcasting Room	sq.m	12.00		
	(b) Control Desk				
	(3) Double Plaster Boards 12mm + 12mm thickness with Silycic Acid Calcium boards 6mm thickness base including glasswool 100mm thickness for the Computer Room	sq.m	46.00		
	(4) Double Plaster Boards 12mm + 12mm thickness including all related works	sq.m	25.50		
	(a) Control Room	sq.m	16.50		
	(b) Living Room	sq.m	16.50		
	(c) Reception Room	sq.m	9.50		
	(d) Traffic Police Office	sq.m			

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD

Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
4.4.3	PVC Wall Covering (Include cover and protect finished work, clearing and all other related works)				
	(a) Control Room	sq.m	215.00		
	(b) Living Room	sq.m	45.50		
	(c) Reception Room	sq.m	45.50		
	(d) Control Desk	sq.m	7.50		
	(e) Broadcasting Room	sq.m	19.00		
	(f) Traffic Police Office	sq.m	29.50		
	(g) Eng. I (Head)	sq.m	28.00		
	(h) Eng. II (Asst)	sq.m	28.00		
	(i) Computer Room	sq.m	96.00		
	(j) Software Storage	sq.m	33.00		
	(k) Maintenance & Storage	sq.m	29.50		
4.4.4	PVC Base (Include apply adhesive, and all others related works)				
	(a) Control Room	m	70.00		
	(b) Control Desk	m	8.00		
	(c) Broadcasting Room	m	14.00		
	(d) Traffic Police Office	m	10.00		
	(e) Eng. I (Head)	m	9.50		
	(f) Eng. II (Asst)	m	9.50		
	(g) Computer Room	m	29.50		
	(h) Software Storage	m	11.00		
	(i) Maintenance & Storage	m	10.00		
4.4.5	Timber Base with Emulsion Paint (Include finishing nails, crews, adhesive, preparation of surfaces, painting and all other related works)				
	(a) Living Room	m	15.50		
	(b) Reception Room	m	15.50		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD					
Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
4.4.6	Carpet Tile 6.5mm thickness (a) Living Room (b) Reception Room	sq.m sq.m	26.00 26.00		
4.4.7	PVC Tile (a) Control Desk (b) Broadcasting Room	sq.m sq.m	12.50 10.00		
4.5	WOODEN DOORS (PAINTED) (include all anchors, hardware, glass & glazing, curing, caulking, sealing, flashings, cleaning and all other related works)				
4.5.1	Single Swinging Door width 800mm x height 2,000mm (a) Reception Room (b) Broadcasting Room (c) Traffic Police Office (d) Computer Room (e) Software Storage (f) Maintenance & Storage	each each each each each each	1 2 1 1 1 1		
4.5.2	Double Swinging Doors width 1,200mm x height 2,000mm (a) Living Room (b) Reception Room (c) Eng. I (Head) (d) Eng. II (Asst)	each each each each	1 1 1 1		
4.5.3	Double Swinging Doors width 1,800mm x height 2,000mm (a) Control Room (b) Computer Room	each each	1 2		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
4.5.4	Double Swinging Doors width 800mm x height 800mm (a) Control Room (b) Living Room (c) Reception Room	each each each	4 1 2		
4.6	METAL DOORS AND WINDOWS Including all anchors, hardware, glass & glazing, curing, caulking, sealing, flashings, cleaning and all other related works.				
4.6.1	Double Swinging Steel Doors width 1,800mm x height 2,000mm (a) Power Supply Room (b) Generator Room	each each	1 1		
4.6.2	Jalousie Windows Full Surround Aluminum Frames width 800mm x height 800mm (a) Generator Room	each	1		
4.6.3	Aluminum Louvers width 1,800 mm x height 1,200 mm (a) Power Supply Room	each	2		
4.6.4	Aluminum Louvers width 2,000 mm x height 2,000 mm (a) Generator Room	each	1		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES
(4) TRAFFIC CONTROL CENTER AND STORAGE YARD

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
4.6.5	Aluminum Frame Sash with clear float glass in broadcasting room including anchors, hardware, curing, caulking, sealing, flashings, cleaning and all other related works.	unit	1		
4.6.6	Horizontal Sliding Window Full Surround Aluminium width 1,000mm x height 400mm	unit	1		
4.6.7	Fix Window Full Surround Aluminium width 1,200 x height 2,000mm	unit	1		
4.7	ROOFING AND SIDING				
4.7.1	Asphalt Waterproofing (Include levelling mortar, built-up asphalt waterproofing, sealing and all other related works)				
	(a) Asphalt waterproofing for roof of generator room	sq.m	30.00		
	(b) Asphalt waterproofing for floor of generator room	sq.m	30.00		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD					
Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
4.8	FALSE OR SUSPENDED CEILING (Include all adhesives, staples, screws, expansion joints, suspension systems, inspection hatches, aluminum frames, finishing point and other accessories)				
4.8.1	Acoustic Rockwool Board 12mm thick with plaster board 9mm thick as Base (System-2) (a) Control Room (b) Living Room (c) Reception Room (d) Traffic Police Office (e) Eng. I (Head) (f) Eng. II (Asst) (g) Computer Room (h) Software Storage (i) Maintenance & Storage	sq.m	116.50 26.00 26.00 12.50 12.50 12.50 173.50 15.00 22.50		
4.9	PAINING WORKS (Include all the items described in the technical specifications, but excluding the finishing point on architectural metals, on suspended ceiling)				
4.9.1	Emulsion Paint (a) Control Room (b) Living Room (c) Reception Room (d) Traffic Police Office (e) Eng. I (Head) (f) Eng. II (Asst) (g) Computer Room (h) Software Storage (i) Maintenance & Storage	sq.m	116.50 26.00 26.00 12.50 12.50 12.50 173.00 15.00 22.50		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD					
Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
4.9.2	Acrylic Resin Emulsion Sprayed for Generator Room	sq.m	140.00		
4.10	METAL WORKS				
4.10.1	Stainless Steel Scupper Flashings (include sealing and all other related works)				
	(a) Generator Room	each	2		
4.11	FURNITURE				
4.11.1	Built-in Furniture (Counter table in Broadcasting room including reinforcement fitting, plastic laminated top, edges and other related works)	Unit	2		
4.11.2	Movable Furniture				
	(a)Sofa with stool	each	2		
	(b)Sofa	each	3		
	(c)Armchair	each	11		
	(d)Chair	each	4		
	(e)Desk	each	5		
	(f)Table with Chairs	each	1		
	(g)Long Table	each	1		
	(h)Meeting table with chairs	each	1		
4.11.3	Equipment				
	(a)Kitchen unit (include sink and electrical hot plate and other related accessory in living room)	L.S. unit	1		
	(b)Refrigerator in Living Room	unit	1		
	(c)TV & Video tape recorder with cabinet in living room	unit	1		
	(d)Ventilator with fresh air intake duct in Broadcasting Room	unit	2		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
4.12	<p>FEEDER & POWER WIRING SYSTEM (include all those necessary for supply of materials with fittings, installation, termination of cable joint, connection, conduit accessories, box, miscellaneous, test and etc)</p> <ul style="list-style-type: none"> (a) Control Panel (b) Battery Charger Panel (c) Switch Panel (d) Power Control Panel (e) Lighting Control Panel (f) CVCF Facility (g) Lightning & Grounding (h) Cable (i) Piping (j) Other fitting & Accessories (k) Excavation & Backfill (l) Site Erection Works 	<ul style="list-style-type: none"> set set set set set unit unit L.S. L.S. L.S. L.S. L.S. 	<ul style="list-style-type: none"> 1 1 1 1 1 1 1 1 1 1 1 1 		
4.13	<p>POWER GENERATOR WORKS (include all those necessary for supply of generator engine, generator, batteries, battery charger, control panel, service tank with accessories, miscellaneous, test & etc)</p>	<ul style="list-style-type: none"> set 	<ul style="list-style-type: none"> 1 		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD					
Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
4.14	LIGHTING & SOCKET OUTLET SYSTEM (Include all those necessary for supply of materials with fittings, installation, conduit accessories, box, miscellaneous, test and etc)				
4.14.1	(a) Conduit Pipe	L.S.	1		
	(b) Fittings, etc.	L.S.	1		
	(c) Joint Box, etc.	L.S.	1		
	(d) Cabling	L.S.	1		
	(e) Switch, etc.	L.S.	1		
	(f) Socket Outlet	L.S.	1		
4.14.2	(a) Lighting Fixture A	set	87		
	(b) Lighting Fixture B	set	6		
	(c) Lighting Fixture C	set	12		
	(d) Lighting Fixture D	set	20		
	(e) Lighting Fixture E	set	5		
	(f) Lighting Fixture F	set	2		
	(g) Lighting Fixture G	set	1		
	(h) Lighting Fixture H	set	8		
	(i) Lighting Fixture I	set	6		
	(j) Lighting Fixture J	set	12		
4.14.3	Supporting Material	L.S.	1		
4.14.4	Site Erection Work	L.S.	1		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD

Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
4.15	TELEPHONE & FACSMILE WORK (include all those necessary for supply of materials with fittings, installation, conduit accessories, box, miscellaneous, grounding, excavation, backfill, test and etc)				
4.15.1	(a) Conduit Pipe	L.S.	1		
	(b) Fitting & Accessories	L.S.	1		
	(c) Joint Box, etc.	L.S.	1		
4.15.2	Cable				
	(a) TIVF 0.4-2P	m	900.00		
	(b) CCP-AP 0.65-100P	m	50.00		
4.15.3	Automatic Telephone Exchange Set (push button type)	unit	1		
4.15.4	Telephone Handset	unit	11		
4.15.5	Facsimile	unit	2		
4.15.6	Terminal Box	unit	1		
4.15.7	Site Erection Work	L.S.	1		
4.16	AIR CONDITIONING WORK (include all those necessary for supply of materials with fittings, installation, conduit accessories, box, miscellaneous, test and etc)				
4.16.1	Air cooled type packaged Air conditioner with cooling capacity 42,500 kcal/hr Compressor of 7.5 Kw x 2; Fan 250 CMH x 6 MMAQ x 7.5 Kw with filter	set	6		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD					
Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
4.16.2	SF-1 Air Supply Fan	set	6		
4.16.3	AF-1 Air Filter	set	1		
4.16.4	Site Erection Work	L.S.	1		
4.17	DUCT WORKS (include all those necessary for supply of materials with fittings, installation, conduit accessories, box, miscellaneous, test and etc)				
4.17.1	Galvanized plate	sq.m	60.00		
4.17.2	Damper	L.S.	1		
4.17.3	Louver	L.S.	1		
4.17.4	Joint	L.S.	1		
4.17.5	Insulation Work	L.S.	1		
4.17.6	Site Erection Works	L.S.	1		
4.18	PIPING WORKS FOR AIR CONDITIONING (include all those necessary for supply of materials with fittings, accessories, miscellaneous, test and etc)				
4.18.1	Copper Pipe	L.S.	1		
4.18.2	Drain Pipe SGP 40A	m	90.00		
4.18.3	Fitting & Accessories	L.S.	1		
4.18.4	Insulation & Painting Works	L.S.	1		
4.18.5	Cable (VVF 2.6-309)	m	520.00		
4.18.6	Site Erection Works	L.S.	1		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD

Item No.	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
4.19	VENTILATION WORKS (include all those necessary for supply of materials with fittings, accessories, miscellaneous, test and etc)				
4.19.1	Ventilation (a) F-1: 50CMH x 3mmAg x 18W (b) F-2: 100CMH x 4mmAg x 13W (c) F-3: 150CMH x 5mmAg x 35W (d) F-4: 60CMH x 3mmAg x 18W (e) F-5: 1,000CMH x 5mmAg x 50W	set	3 3 3 3 1		
4.19.2	Site Erection Works	L.S.	1		
4.19.3	Duct Work - spiral duct	L.S.	1		
4.19.4	Vent Cap	L.S.	1		
4.19.5	Damper	L.S.	1		
4.19.6	Site Erection Works	L.S.	1		
4.20	FIRE FIGHTING WORKS				
4.20.1	Halogen Fire Fighting System (include all those necessary for supply of halogen bomb 681/50kg and reserve, control valve 80A and 65A, starter, halogen head, control panel, control panel with site lamp, speaker, piping materials, cable, name plate, guide panel, and other accessories, with installation, miscellaneous, etc)	set	1		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
4.20.2	Automatic Fire Alarm System (include all those necessary for supply of receiver, control panel, smoke detectors, actuator spot cable and miscellaneous, with fittings and installation, test, etc)	set	1		
4.20.3	Portable Fire Extinguisher (ABC and halogen extinguishers)	L.S.	1		
4.20.4	Site Erection Works	L.S.	1		
4.21	STORAGE YARD	L.S.	1		
				Total	

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(5) REQUIRED SPARE PARTS AND MAINTENANCE EQUIPMENT

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
5.1	For Work Station (a) Floppy disk - 5.25 inch (10 per box) (b) Floppy disk - 3.5 inch (10 per box) (c) Laser Printer toner (d) Printer ribbon for dot- matrix printer (e) Printer paper A4 (5 reams per box) (f) Printer paper - 11" continuous feed (2000 sheet per box) (g) Printer paper - 15" continuous feed (2000 sheet per box)	box box each each box box box	10 10 20 50 10 10 20		
5.2	For Line Printer (a) Ribbon for line printer (b) Printer paper - 15" continuous feed (2000 sheet per box)	each box	20 20		
5.3	2400 feet magnetic tape	each	10		
5.4	Video Tape (90 min)	each	20		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(5) REQUIRED SPARE PARTS AND MAINTENANCE EQUIPMENT

Item No. (a)	Particular (b)	Unit (c)	Qty. (d)	Unit Price (in Baht) (e)	Total (in Baht) (f)
5.5	For Local Controller (a) Fully equipped local controller cabinet (include controller, power unit, detector chassis, load switches etc. ready for field installation at any site) (b) Controller unit (c) Power unit (d) Main circuit breaker (e) Load switch unit (f) Modem (g) P.ROM including phase sequence (h) Surge absorber for signal aspects line and detector line (i) Solid state relay unit (j) Solid state relay (k) Fuse for TOT line	each	3		
		each	5		
		each	5		
		each	5		
		each	5		
		each	5		
		each	143		
		each	500		
		each	20		
		each	100		
		each	500		
5.6	For Signal Pole (a) Type A pole (b) Type B pole (c) 12P terminal board (d) 20P terminal board	each	20		
		each	10		
		each	10		
		each	10		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(5) REQUIRED SPARE PARTS AND MAINTENANCE EQUIPMENT

Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
5.7	For Vehicle Lantern - 200mm (a) Lantern - 3 aspects (b) Lantern - 2 aspects (c) Green lens (d) Yellow lens (e) Red lens (f) Arrow mask (g) Target board - 3 aspects (h) Target board - 4 aspects (i) Target board - 6 aspects (j) Visor (k) Mounting bracket	set set each each each each each each each each each set	15 5 10 10 10 10 60 20 60 60 30		
5.8	For Vehicle Lantern - 300mm (a) Lantern - 3 aspects (b) Lantern - 1 aspects (c) Green lens (d) Yellow lens (e) Red lens (f) Arrow mask (g) Visor (h) Mounting bracket	set set each each each each each set	15 5 10 10 10 10 60 30		
5.9	Signal Lamps (a) 12 V 55 watts halogen	each	3500		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(5) REQUIRED SPARE PARTS AND MAINTENANCE EQUIPMENT

Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
5.10	For Detectors				
	(a) Fully equipped detector cabinet (include power unit, TTR)	set	4		
	(b) Pre-processor for detector pulse	each	10		
	(c) Power Unit	each	5		
	(d) Loop detector unit	each	20		
	(e) Loop coil cable	meter	400		
	(f) Loop coil feeder cable	meter	500		
	(g) Loop coil jointing sheath	each	50		
	(h) Loop coil filling material	litre	50		
	(i) Ultrasonic Detector Unit	each	5		
	(j) Ultrasonic detector head	each	5		
	(k) Ultrasonic feeder cable	meter	150		
5.11	CCTV				
	(a) CCTV camera with zoom lens	camera	1		
	(b) CCTV camera controller unit	each	1		
5.12	Maintenance Equipment				
	(a) Portable cable checker	set	2		
	(b) Megger 250 V and 500 V DC	set	2		
	(c) Earth tester	set	2		
	(d) Ultrasonic detector checker	set	1		
	(e) Drainage pump AC200 V 60H 0.25m ³ /hub ~ 4.3 m	set	2		
	(f) Transmission test set	set	3		
	(g) Multiple tester	set	5		
	(h) AC ampere meter	set	2		
	(i) Tool set	set	2		

ANNEX B-2 : SCHEDULE OF RATES AND PRICES

(5) REQUIRED SPARE PARTS AND MAINTENANCE EQUIPMENT

Item No.	Particular	Unit	Qty.	Unit Price (in Baht)	Total (in Baht)
(a)	(b)	(c)	(d)	(e)	(f)
5.13	Maintenance Vehicle and Equipment (a) Vehicle (van 1600 cc) (b) Local Controller (c) Power Generator 5KvA (d) Parts/Tools racks and compartment	each each each set	2 2 2 2		
5.14	Maintenance Data Processor System (a) Data processor system (b) Software (c) EP-ROM writer/eraser	set set set	2 2 1		
				Total	

ANNEX B-3 : STATEMENT OF COMPLIANCE

In this Annex the Tenderer shall clearly state whether the Tender offered does or does not comply with the individual Section or Sub-section of the Specification.

It is required that each Section and Sub-section be dealt with in the order that they appear in the Specification. Where the Tender does not comply with the Specification, reference shall be made to supporting document or the Tenderer's Technical Proposal, clearly illustrating the points of difference and whether the Tenderer considers his system as equivalent or better than that in the Specification.

(1) STATEMENT OF COMPLIANCE WITH TECHNICAL SPECIFICATION

I/We hereby certify that this Tender Document complies fully with the Technical Specification documents except as listed below in pages ____ to ____ .

Signature: _____

Name (Block Letters): _____

Company: _____

Position: _____

Dated this _____ day of _____, 1990

**LISTING OF NON COMPLIANCE WITH THE TECHNICAL
SPECIFICATION**

(Sample Form)

No.	Section/sub-section in Technical Specification	Reference to Tenderer's Technical Proposal/supporting Document

ANNEX B-4 : DETAILS OF EQUIPMENT

(1) GENERAL REQUIREMENTS						
Reference Item No. in Tender Schedule	Description	Name of Maker	Model No.	Number of Year in Use	Places Used	Other Details

ANNEX B-4 : DETAILS OF EQUIPMENT

(2) TRAFFIC SIGNAL SYSTEM						
Reference Item No. in Tender Schedule	Description	Name of Maker	Model No.	Number of Year in Use	Places Used	Other Details

ANNEX B-4 : DETAILS OF EQUIPMENT

(3) CCTV SYSTEM						
Reference Item No. in Tender Schedule	Description	Name of Maker	Model No.	Number of Year in Use	Places Used	Other Details

ANNEX B-4 : DETAILS OF EQUIPMENT

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD						
Reference Item No. in Tender Schedule	Description	Name of Maker	Model No.	Number of Year in Use	Places Used	Other Details

ANNEX B-5 : PROPOSED RATES AND PRICES OF ALTERNATIVE EQUIPMENT (Sample Form)

(1) GENERAL REQUIREMENTS						
Instruction To Tenderers : Tenderers should state the reason(s) for each of the items proposed as an alternative equipment						
Reference To Specification/Conditions:						
Item No.	Replaced Item No.	Particulars	Unit	Quantity	Unit Price in Baht	Total In Baht
(a)	(b)	(c)	(d)	(e)	(f)	(g)
Reasons:						
Reasons:						
Reasons:						
Reasons:						

ANNEX B-5 : PROPOSED RATES AND PRICES OF ALTERNATIVE EQUIPMENT (Sample Form)

(2) TRAFFIC SIGNAL SYSTEM						
Instruction To Tenderers : Tenderers should state the reason(s) for each of the items proposed as an alternative equipment						
Reference To Specification/Conditions:						
Item No.	Replaced Item No.	Particulars	Unit	Quantity	Unit Price in Baht	Total In Baht
(a)	(b)	(c)	(d)	(e)	(f)	(g)
Reasons:						
Reasons:						
Reasons:						
Reasons:						

ANNEX B-5 : PROPOSED RATES AND PRICES OF ALTERNATIVE EQUIPMENT (Sample Form)

(3) CCTV SYSTEM						
Instruction To Tenderers : Tenderers should state the reason(s) for each of the items proposed as an alternative equipment						
Reference To Specification/Conditions:						
Item No.	Replaced Item No.	Particulars	Unit	Quantity	Unit Price in Baht	Total in Baht
(a)	(b)	(c)	(d)	(e)	(f)	(g)
Reasons:						
Reasons:						
Reasons:						
Reasons:						

ANNEX B-5 : PROPOSED RATES AND PRICES OF ALTERNATIVE EQUIPMENT (Sample Form)

(4) TRAFFIC CONTROL CENTER AND STORAGE YARD						
Instruction To Tenderers : Tenderers should state the reason(s) for each of the items proposed as an alternative equipment						
Reference To Specification/Conditions:						
Item No.	Replaced Item No.	Particulars	Unit	Quantity	Unit Price in Baht	Total in Baht
(a)	(b)	(c)	(d)	(e)	(f)	(g)
Reasons:						
Reasons:						
Reasons:						
Reasons:						

**ANNEX B-6 : PROPOSED RATES AND PRICES OF RECOMMENDED SPARE PARTS AND
MAINTENANCE EQUIPMENT (Sample Form)**

Instruction To Tenderers : List spares and maintenance equipment which have not been included in the Schedule of Required spares and maintenance equipment but will likely be required for 2 years of extended maintenance after system acceptance.					
Item No.	Description and Details	Unit	Quantity	Unit Price in Baht	Total in Baht
Total					

ANNEX B-7 : PROPOSED RATES AND PRICES OF EXTENDED MAINTENANCE (Sample Form)

Part I: Monthly Inspection and Corrective Maintenance						
Item No.	Description	Unit	Quantity	Unit Cost Per Month In Baht	Total Cost Per Month In Baht	Total Cost Per Year In Baht
1.	Monthly Inspection of Control Center Equipment	L.S.	-			
2.	Corrective Maintenance of Control Center Equipment (labor, equipment and incidental only)	L.S.	-			
3.	Monthly Inspection of Signal	Signal	146			
4.	Corrective Maintenance of Signal	Signal	146			
5.	Monthly Inspection of Loop-coil Detector	Detector	387			
6.	Corrective Maintenance of Loop-coil Detector	Detector	387			
7.	Monthly Inspection of Ultrasonic Detector	Detector	71			
8.	Corrective Maintenance of Ultrasonic Detector	Detector	71			
9.	Monthly Inspection of CCTV Field Equipment	Camera Site	5			
10.	Corrective Maintenance of CCTV Field Equipment	Camera Site	5			
					Annual Total of Part I:	
Part II: Quarterly and Bi-annual Inspection						
1.	Quarterly and Bi-annual Inspection of Control Center	L.S.	--			
2.	Quarterly and Bi-annual Inspection of Signal	Signal	146			
3.	Quarterly and Bi-annual Inspection of Loop-coil Detector	Detector	387			
4.	Quarterly and Bi-annual Inspection of Ultrasonic Detector	Detector	71			
5.	Quarterly and Bi-annual Inspection of CCTV Field Equipment	Camera Site	5			
					Annual Total of Part II:	

ANNEX B-7 : PROPOSED RATES AND PRICES OF EXTENDED MAINTENANCE (Sample Form)

Part III: Accident Repair										
(A) Labor Rates:										
Item No.	Classification	Hourly Rate in Baht		Estimated Hours		Total Cost Per Year in Baht		Regular Tim	Overtime	Total
		Regular Tim	Overtime	Regular Tim	Overtime	Regular Tim	Overtime			
1.	Signal Maintenance Supervisor			500	100					
2.	Signal Maintenance Technician			1500	300					
3.	Laborer			3000	600					
						Estimated Total Annual Labor Cost (Part IIIA)				
(B) Material and Spare Parts										
1.	Contractor's Material and Spare Parts Mark-up Rate (a) _____ percent									
2.	Estimated Annual Material Cost (Contractor's Cost) (b) Baht 3,000,000									
3.	Estimated Total Annual Cost of Material and Spare Parts $\{(b) \times (1 + (a))\}$ = Baht 3,000,000 x 1. _____ = Baht _____ [Total of Part III(B)]									
4.	Annual Total of Part III(A) and Part III(B) = Baht _____									
5.	Annual Total of Parts I, II and III = Baht _____									
(C) Equipment Rates										
Name	Minimum Charge in Baht				Hourly Charge in Baht					
1. Bucket Truck										
2. Platform Truck										
3. Pickup Truck										
4. Others (specify)										

ANNEX B-7 : PROPOSED RATES AND PRICES OF EXTENDED MAINTENANCE (Sample Form)

Part IV: Unit Cost Rates For Frequently Required Accident Repairs			
Item	Description	Unit	Unit Cost in Baht *
1.	Remove and Replace Knockdown Pole - Type A	Each	
2.	Remove and Replace Knockdown Pole - Type B (The above items assume the existing foundation is still reusable)	Each	
5.	Install 300 mm x 3 lantern/wiring to block	Each	
6.	Install 200 mm x 3 lantern/wiring to block	Each	
7.	Install Pedestrian lantern/wiring to block	Each	
8.	Install Pedestrian push button/wiring to block	Each	
9.	Install target board (per lantern set) - 200 mm	Each	
10.	Install target board (per lantern set) - 300 mm	Each	
11.	Install Visor - 200 mm	Each	
12.	Install Visor - 300 mm	Each	
13.	Install local controller powerline circuit breaker	Each	
14.	Re-seal exposed loop coil	Loop	
15.	Install loop coil on concrete and connect to lead-in cable	Loop	
16.	Install loop coil on asphalt and connect to lead-in cable	Loop	
17.	Install detector lead-in cable in existing conduit	Loop	
18.	Install ultrasonic head including wiring and calibration	10-meter Each	

* Unit Cost shall include all labor, material, spare parts, equipment, all incidentals, and necessary splicing or connections to effect a complete repair or functional installation